

*Final*

# **Nellis Air Force Base Capital Improvements Program Environmental Assessment**



*Prepared for*  
**Nellis AFB, NV**

*August 2013*

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## LIST OF ACRONYMS AND ABBREVIATIONS

|                |   |                   |   |
|----------------|---|-------------------|---|
| 99 ABW         | 99 <sup>th</sup> Air Base Wing  | LEED              | Leadership in Energy and Environmental Design                         |
| ACC            | Air Combat Command  | LF                | linear feet   |
| ACES           | Automated Civil Engineer System                                       | MILCON            | Military Construction   |
| ACM            | Asbestos-Containing Material  | MSAT              | Mobile Source Air Toxics  |
| ADP            | Area Development Plan   | MSL               | Mean Sea Level  |
| AFB            | Air Force Base  | NAAQS             | National Ambient Air Quality Standards                                |
| AGE            | Aerospace Ground Equipment  | NDEP              | Nevada Division of Environmental Protection                           |
| AICUZ          | Air Installation Compatible Use Zone                                  | NEPA              | National Environmental Policy Act                                     |
| Air Force/USAF | United States Air Force   | NHPA              | National Historic Preservation Act                                    |
| APZ            | Accident Potential Zone   | nm                | nautical miles  |
| ATG            | Adversary Tactics Group   | NO <sub>2</sub>   | Nitrogen Dioxide  |
| BTU            | British thermal unit  | NO <sub>x</sub>   | Nitrogen Oxide  |
| CAA            | Clean Air Act   | NDPES             | National Pollutant Discharge Elimination System                       |
| CCDAQEM        | Clark County Department of Air Quality and Environmental Management   | NRHP              | National Register of Historic Places                                  |
| CCW            | Command and Control Wing  | NTTR              | Nevada Test and Training Range  |
| CEP            | Central Energy Plant  | O <sub>3</sub>    | Ozone   |
| CEQ            | Council on Environmental Quality                                      | O&M               | Operations and Maintenance  |
| CERCLA         | Comprehensive Environmental Response, Compensation, and Liability Act | PM <sub>10</sub>  | Particulate Matter Less than 10 Microns                               |
| CFR            | Code of Federal Regulations   | PM <sub>2.5</sub> | Particulate Matter Less than 2.5 Microns                              |
| CIP            | Capital Improvements Program  | QD                | Quantity Distance   |
| CO             | Carbon Monoxide   | RCRA              | Resource Conservation and Recovery Act                                |
| CWA            | Clean Water Act   | RED HORSE         | Rapid Engineers Deployable Heavy Operational Repair Squadron Engineer |
| CZ             | Clear Zone  | SHPO              | State Historic Preservation Office                                    |
| dB             | Decibel   | SIP               | State Implementation Plan   |
| dBA            | A-Weighted Decibel  | SO <sub>2</sub>   | Sulfur Dioxide  |
| DNL            | Day-Night Average Sound Level   | SO <sub>x</sub>   | Sulfur Oxide  |
| DoD            | Department of Defense   | THPO              | Tribal Historic Preservation Office                                   |
| EA             | Environmental Assessment  | UFC               | Unified Facilities Criteria   |
| ECIP           | Energy Conservation Improvement Program                               | UNLV              | University of Nevada Las Vegas  |
| EIAP           | Environmental Impact Analysis Process                                 | U.S.              | United States   |
| EIS            | Environmental Impact Statement  | US-93             | United States Highway 93  |
| EPA            | United States Environmental Protection Agency                         | USACE             | United States Army Corps of Engineers                                 |
| ERP            | Environmental Restoration Program                                     | USAFWC            | United States Air Force Warfare Center                                |
| ESA            | Endangered Species Act  | USC               | United States Code  |
| FDE            | Force Development Evaluation  | USCB              | United States Census Bureau   |
| FY             | Fiscal Year   | USFWS             | United States Fish and Wildlife Service                               |
| GHG            | greenhouse gas  | VOC               | Volatile Organic Compound   |
| gpd            | Gallons Per Day   | WINDO             | Wing Infrastructure and Development Outlook                           |
| HAP            | hazardous air pollutant   | WS                | Weapons School  |
| HAZMART        | hazardous material pharmacy   | WSA               | Weapons Storage Area  |
| HAZMAT         | Hazardous Materials   |                   |   |
| HQ             | Headquarters  |                   |   |
| IAP            | Initial Accumulation Point  |                   |   |
| JSF            | Joint Strike Fighter  |                   |   |
| kV             | Kilovolt  |                   |   |
| LBP            | Lead-Based Paint  |                   |   |

## **FINDING OF NO SIGNIFICANT IMPACT**

### **1.0 NAME OF THE PROPOSED ACTION**

Nellis Air Force Base Capital Improvements Program (CIP) Environmental Assessment (EA).

### **2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

Nellis Air Force Base proposes to formally update the CIP which continually evolves, the last formal proposal which resulted in National Environmental Policy Act (NEPA) documentation was during the 2008 update of the Nellis Air Force Base (AFB) General Plan. The mission changes at Nellis AFB are substantive enough to require update of the CIP projects list. Restoration/Modernization and Sustainment projects would provide the base with up-to-date facilities by repairing, remodeling, or replacing older facilities. Also, these outdated facilities demand considerable energy usage, replacing them with new energy efficient, updated facilities would yield considerable savings for the bases and conform to Department of Defense (DoD) guidelines for Leadership in Energy & Environmental Design (LEED) facilities.

The projects described in the CIP are derived from the Base Comprehensive Asset Management Plan (BCAMP). The BCAMP lists all of the proposed projects which have been identified as a bona fide need by the individual proponents of each action. These projects are reviewed by the Civil Engineering Facility Review Board and approved by the 99 Air Base Wing (ABW) Commander based upon criteria including mission requirements, quality of life, degradation of existing facilities, and other factors. While the CIP includes hundreds of projects, funding for all of the projects to be completed in the next 5 years is not feasible because of the limited amount of funds available. These funding limitations are due to worldwide deployments and contingency operations; competing funding requests from other military installations; new missions such as the F-35A beddown; and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year.

Since the overall funding amount available to execute CIP projects is unknown, two construction scenarios have been developed to place reasonable limits on the analyses. Scenario 1 involves light construction and describes demolition of an unspecified 2,000 square foot existing building, and construction of representative 30,000 square foot facility including parking up to 3 acres. The vast majority of the CIP projects combined together would be an aggregate size less than that described for Scenario 1. Scenario 2 triples the size of the demolition and construction up to 10 acres and only the largest or combination of several smaller new construction projects would reach this limit. Other large projects could be implemented if aspects of Scenario 2 would not be implemented, such as roadway projects where there would be no demolition or facility construction, but would be looked at on a case-by-case basis.

The Air Force also analyzed the no-action alternative. Baseline conditions as reflected by the no-action alternative provide a comparison to the environmental impacts of the proposed action.

### 3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The EA provides an analysis of the potential environmental consequences resulting from implementing the proposed action. Ten resource categories were thoroughly analyzed to identify potential impacts. According to the analysis in this EA, implementation of the proposed action would not result in significant impacts to any resource category or significantly affect existing conditions at Nellis AFB. The following summarizes and highlights the results of the analysis by the resource categories anticipated to be affected of land use, infrastructure, socioeconomics, biological resources and air quality. Cultural resources, water and soil resources, hazardous materials and waste, safety, and noise were also analyzed but were determined to have little to no impacts.

**Land Use and Transportation.** All Nellis AFB projects including the CIP projects would be reviewed by the base community planner to assume compatibility with current land uses. To the extent possible, facilities would be clustered together assuring compatible facilities would be sited closer to each other. A traffic circle at the North Gate is being constructed to alleviate congestion at the intersection of Beale Avenue and Ellsworth Avenue. Implementation of this CIP project would alleviate traffic at the intersection, but would cause traffic delays on and off base during the four to six month construction period.

**Infrastructure.** A slight increase in electrical use would be anticipated as a result of the proposed infrastructure construction, repair and demolition projects; however, new facility construction would employ energy conserving equipment to the extent possible. Potable water demand is not expected to increase because many of the projects include water saving aspects. Although a slight increase in wastewater flows could occur, no adverse impacts to wastewater treatment are anticipated. No significant impacts to utilities or infrastructure would result if the proposed action were implemented.

**Socioeconomics.** Under the proposed action, no increase in permanently-based personnel would occur at Nellis AFB in Clark County. The proposed action would not adversely affect housing, schools, or utilities in the Las Vegas area. Operation of the new facilities would draw from existing manpower positions and not create new jobs for any of the communities; therefore, no significant impacts are anticipated if the proposed action were implemented.

**Biological Resources.** Overall, there would be no adverse impact to vegetation, wildlife, wetlands, or special-status species from implementation of the proposed action. None of the CIP projects intersect known desert tortoise habitat or Las Vegas Bearpoppy habitat, and therefore, these species would not be affected. However, should a project arise with the potential to affect desert tortoise, consultation with the United States (U.S.) Fish and Wildlife Service would be initiated. Consultation with the U.S. Army Corps of Engineers would be conducted and a Section 404 permit obtained if required for any capital improvement project with the potential to impact jurisdictional waters of the United States.

**Air Quality.** Air quality would be affected during facility construction period; however, the emissions would not pose an adverse impact. Two demolition/construction scenarios were developed to calculate *de minimis* thresholds for pollutant emissions. Scenario 1 modeled demolition of a two-story, 2,000 square-foot concrete building located on 1 acre of land, and 3 acres of construction for a 30,000 square-foot concrete maintenance shop with a 100,000 square-foot parking lot. Scenario 2 increased demolition to 3 acres and tripled the sizes of the building and parking lot to be demolished. Construction under Scenario 2

tripled the sizes of the building and parking lot and the overall project disturbance area increased to 10 acres. These scenarios assumed that all best management practices, such as watering loose soil and avoiding unnecessary periods of engine-idle, would be in place. In both scenarios, estimated emissions would be below *de minimis* levels, but in the second scenario, PM<sub>10</sub> were estimated to be within 3.5 tons of the *de minimis* threshold of 70 tons per year.

#### 4.0 CONCLUSION

On the basis of the findings of the EA, no significant impact to human health or the natural environment would be expected from implementation of the proposed action or no-action alternative. Therefore, issuance of a Finding of No Significant Impact (FONSI) is warranted, and preparation of an Environmental Impact Statement, pursuant to the NEPA of 1969 (Public Law 91-190) is not required for this action.



BARRY R. CORNISH  
Colonel, USAF  
Commander



Date

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## **NELLIS AIR FORCE BASE CAPITAL IMPROVEMENTS PROGRAM ENVIRONMENTAL ASSESSMENT**

**Responsible Agency:** United States Air Force (Air Force), Nellis Air Force Base (AFB)

**Proposed Action:** Nellis AFB proposes to update the 2008 Capital Improvements Program (CIP). The CIP update proposes a plan to construct new facilities, and/or repair, remodel, maintain or demolish outdated facilities at Nellis AFB, Nevada.

Written comments and inquiries regarding this document should be directed to:

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4430 Grissom Ave, Suite 107  
Nellis AFB NV 89191  
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In addition, the document can be viewed on and downloaded from the World Wide Web at  
[www.nellis.af.mil/library/environment.asp](http://www.nellis.af.mil/library/environment.asp)

**Designation:** Final Environmental Assessment (EA)

**Abstract:** Nellis AFB proposes to initiate updates to the 2008 CIP that would include construction, demolition, renovation, and maintenance activities at the base. By taking a comprehensive approach to planning and implementing facilities and infrastructure improvements over a multi-year period, Nellis AFB would ensure that limited funds, energy conservation, and operational goals are maximized. The CIP contains hundreds of projects, however funding for all of the projects to be completed in the next 5 years is not feasible because of the limited amount of funds available. These funding limitations are due to worldwide deployments and contingency operations; competing funding requests from other military installations; new missions such as the F-35A beddown; and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year.

This Final EA analyzes the potential environmental consequences of the proposed CIP update at Nellis AFB and includes analysis of the no-action alternative.



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*Final*

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Nellis Air Force Base  
Capital Improvements Program  
Environmental Assessment

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**United States Air Force  
Air Combat Command**

August 2013

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# EXECUTIVE SUMMARY

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## **EXECUTIVE SUMMARY**

This Environmental Assessment (EA) analyzes the potential environmental consequences resulting from a proposal to update the Nellis Air Force Base (AFB) Capital Improvement Program (CIP). The CIP for Nellis AFB describes discrete projects, such as major utility upgrades or construction of individual facilities, also reflects planned changes to enhance mission capability, correct space and/or infrastructure deficiencies, and to support future development through modernization, restoration, and sustainment projects. The CIP is first identified in the Nellis AFB General Plan issued in 2006 and last CIP was formalized in 2008. However, internally the CIP evolves regularly as completed projects get deleted from the list and as new requirements are identified and planned. Formal updates to the CIP are driven by planned major mission changes such as the proposed F-35 Joint Strike Fighter (JSF) beddown and the fact that a formal CIP hasn't been updated since 2008.

This EA has been prepared by Nellis AFB in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and Air Force Environmental Impact Analysis Process, as promulgated in Title 32 of the Code of Federal Regulations (CFR) Part 989.

## **PURPOSE AND NEED FOR THE ACTION**

The purpose of the proposed action is to update the CIP to account for mission changes and modernization of outdated facilities and infrastructure. The proposed update to the Nellis AFB CIP is needed to provide the installation and unit commanders with up-to-date development possibilities for the base and to assist the base planners in compliance with the overall vision of the respective missions of Nellis AFB. Additionally, the CIP assigns projects that not only meet this need but also provide the necessary repairs and maintenance for restoration, modernization, and sustainment of facilities to assure facilities are capable of supporting mission needs. CIP projects address facility conditions including plans for future activities such as construction, repair, maintenance, and demolition, following recommendations for architectural compatibility and landscaping.

## **PROPOSED ACTION AND NO-ACTION ALTERNATIVE**

Nellis AFB proposes to initiate updates to the CIP that would include construction, demolition, renovation, and maintenance activities at the base. By taking a comprehensive approach to planning and implementing facilities and infrastructure improvements over a multi-year period, Nellis AFB would ensure that limited funds, energy conservation, and operational goals are maximized. Proposed improvements would comply with the Department of Defense's (DoD) direction to design and build Leadership in Energy & Environmental Design (LEED) facilities and decrease energy consumption on military installations.

The projects described in the CIP are derived from the Base Comprehensive Asset Management Plan (BCAMP). The BCAMP lists all of the proposed projects which have been identified as a bona fide need by the individual proponents of each action. These projects are reviewed by the Civil Engineering

Facility Review Board and approved by the 99<sup>th</sup> Air Base Wing (99 ABW) Commander based upon criteria including mission requirements, quality of life, degradation of existing facilities, and other factors. While the CIP includes hundreds of projects, funding for all of the projects to be completed in the next 5 years is not feasible because of the limited amount of funds available. These funding limitations are due to worldwide deployments and contingency operations, competing funding requests from every other military installation, new missions such as the F-35A beddown, and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year. In addition to the proposed action, the Air Force analyzed the no-action alternative.

Since the overall funding amount available to execute CIP projects is unknown, two construction scenarios have been developed to place reasonable limits on the analyses. Scenario 1 involves light construction and describes demolition of an unspecified 2,000 square foot existing building, and construction of representative 30,000 square foot facility including parking up to 3 acres. The vast majority of the CIP projects combined together would be an aggregate size less than that described for Scenario 1. Scenario 2 triples the size of the demolition and construction up to 10 acres and only the largest or combination of several smaller new construction projects would reach this limit. Other large projects could be implemented if aspects of Scenario 2 would not be implemented, such as roadway projects where there would be no demolition or facility construction, but would be looked at on a case-by-case basis.

## **MITIGATION MEASURES**

In accordance with 32 CFR 989.22, the Air Force must indicate if any mitigation measures would be needed to implement the proposed action. However, no mitigation measures would be needed to arrive at a Finding of No Significant Impact (FONSI) if the proposed CIP update action was selected for implementation at Nellis AFB.

## **SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**

This EA provides an analysis of the potential environmental consequences resulting from implementation of the proposed CIP update action and the no-action alternative. Ten resource categories were analyzed to identify potential impacts: land use and transportation; infrastructure; socioeconomics; cultural resources; biological resources; water and soil resources; air quality; hazardous materials and waste; safety; and noise. According to the analysis in this EA, implementation of the proposed action or no-action alternative would result in no significant environmental impacts in any resource category. Implementing the proposed action would not significantly affect existing conditions at Nellis AFB. The following Table ES-1 summarizes and highlights the results of the analysis by resource category.

**Table ES-1. Comparison of Alternatives by Resource**

| <b>Resource Category</b>    | <b>CIP Update</b>  | <b>No-Action Alternative</b>  |
|-----------------------------|--|---|
| Land Use and Transportation | <ul style="list-style-type: none"> <li>Land Use planning would ensure siting of compatible missions within appropriate land use categories and noise zones.</li> <li>A project involving a traffic circle at the North Gate would disrupt traffic for a period of several months. This would increase traffic on Las Vegas Blvd and Craig Road but would still not rise to the levels experienced in the mid-2000s.</li> </ul>   | <ul style="list-style-type: none"> <li>Current land uses and transportation conditions would remain unchanged.</li> </ul>   |
| Infrastructure              | <ul style="list-style-type: none"> <li>Slight increase of electrical use due to the proposed infrastructure construction, repair and demolition projects, however, increase would be temporary.</li> <li>No increase in personnel would occur and no increase in potable water use is anticipated.</li> </ul>  | <ul style="list-style-type: none"> <li>No change to existing infrastructure.</li> </ul>   |
| Socioeconomics              | <ul style="list-style-type: none"> <li>Construction activity on Nellis AFB would increase and support short-term beneficial impacts to the local community.</li> </ul>   | <ul style="list-style-type: none"> <li>No change to existing socioeconomic resources.</li> </ul>  |
| Cultural Resources          | <ul style="list-style-type: none"> <li>The Nellis AFB footprint has been completely inventoried and the proposed action would not impact any known archaeological or historical resources.</li> <li>All proposals for removing or altering existing facilities would be reviewed by the Nellis AFB Cultural Resources Manager to determine and implement the appropriate consultation requirements.</li> </ul>   | <ul style="list-style-type: none"> <li>The effect on the environment would be unchanged relative to baseline.</li> </ul>  |
| Biological Resources        | <ul style="list-style-type: none"> <li>No adverse impacts to vegetation, wetland or waters of the United States (U.S.), wildlife, or special-status species from implementation of the proposed action.</li> <li>Consultation with the U.S. Army Corps of Engineers (USACE) would be conducted and a Section 404 permit obtained, if required.</li> <li>Consultation with the U.S. Fish and Wildlife Service (USFWS) for desert tortoise, Section 7, Endangered Species Act compliance, if required.</li> <li>Construction is not planned in the Las Vegas bearpoppy habitat areas.</li> </ul> | <ul style="list-style-type: none"> <li>No change to current baseline conditions on Nellis AFB.</li> </ul>   |
| Water and Soil Resources    | <ul style="list-style-type: none"> <li>Impacts would be minimized by use of best management practices required by the base and permits.</li> <li>Overall water use would not increase at Nellis AFB as the proposed action is not associated with any personnel increase.</li> <li>Many projects include upgrades to the water system and/or use water saving devices and landscaping to conserve water.</li> </ul>  | <ul style="list-style-type: none"> <li>Ongoing activities at Nellis AFB would continue at baseline levels; no additional effects on water resources would occur.</li> </ul> |
| Air Quality                 | <ul style="list-style-type: none"> <li>Emissions generated by construction, demolition, and paving would be localized and temporary.</li> <li>Maximum emissions of any criteria pollutant would not exceed <i>de minimis</i> thresholds.</li> </ul>  | <ul style="list-style-type: none"> <li>No change to existing emissions.</li> </ul>  |



**Table ES-1. Comparison of Alternatives by Resource (con't)**

| <b>Resource Category</b>      | <b>CIP Update</b>  | <b>No-Action Alternative</b>  |
|-------------------------------|--|---|
| Hazardous Materials and Waste | <ul style="list-style-type: none"><li>• Any new waste streams would be handled in accordance with current Nellis AFB hazardous materials and waste plans.</li><li>• If proposed facilities are affected by the location of an active Environmental Restoration Program (ERP) site, Nellis AFB would seek the required ERP waiver from Headquarters (HQ) ACC and consult with the Nevada Department of Environmental Protection (NDEP) at the planning phase.</li></ul> | <ul style="list-style-type: none"><li>• Ongoing activities at Nellis AFB would continue at baseline levels.</li></ul> |
| Safety                        | <ul style="list-style-type: none"><li>• Established safety guidelines and procedures would continue to be observed.</li><li>• No incompatible projects would occur within safety zones.</li></ul>  | <ul style="list-style-type: none"><li>• No change to current practices would occur.</li></ul>                         |
| Noise                         | <ul style="list-style-type: none"><li>• Construction noise impacts would be localized within the installations, and of short-term duration.</li><li>• No long-term increase of noise is anticipated.</li></ul>   | <ul style="list-style-type: none"><li>• Baseline conditions would continue within current contours.</li></ul>         |

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# **CHAPTER 1**

## **PURPOSE AND NEED FOR THE PROPOSED ACTION**

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## **1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION**

### **1.1 INTRODUCTION**

The Capital Improvements Program (CIP) for Nellis Air Force Base (AFB) describes discrete projects, such as major utility upgrades and construction of individual facilities. It also presents planned changes to enhance mission capability and correct space and/or infrastructure deficiencies. At the core of the CIP are lists describing these discrete projects sorted by Military Construction (MILCON) or Operations and Maintenance (O&M). There are two MILCON lists; one for current existing missions and one for the new mission, the F-35 which was assessed in the F-35 Force Development Evaluation and Weapons School Beddown Environmental impact Statement (Air Force 2011a). The O&M lists are distinguished by; Restoration and Modernization, Sustainment, and O&M Construction Projects. The latter is a master list containing all O&M projects including those that are not classified as either Restoration and Modernization or Sustainment.

The CIP was first identified in the Nellis AFB General Plan issued in 2006 and the last CIP was formalized in 2008 (Air Force 2008). However, internally the CIP evolves regularly as completed projects get deleted from the list and as new requirements are identified and planned. Formal updates to the CIP are driven by planned major new mission changes such as the F-35 Joint Strike Fighter (JSF) beddown. A formal CIP update has not been prepared since 2008.

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States [U.S.] Code [USC] 4321-4347), Nellis AFB has prepared this Environmental Assessment (EA) that considers the potential consequences to human health and the natural environment. In addition, this EA complies with the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Sections 1500-1508), and 32 CFR Part 989, *et seq.*, Air Force Environmental Impact Analysis Process (EIAP). This EA examines the consequences of implementing the proposed updates and implementation of the 99 ABW CIP and includes analysis of the no-action alternative.

### **1.2 BACKGROUND**

Nellis AFB is home to the U.S. Air Warfare Center (USAFWC). Nellis AFB hosts large training exercises known as Red Flags, Green Flags, and Blue Flags and home for tactical testing under the 53<sup>rd</sup> Wing. The 99 ABW is the host wing for the installation and is responsible for base security, mission support, civil engineering, communications, and personnel support. The wing conducts the day-by-day operation of the installation and supports over 10,000 military and civilian employees assigned to Nellis and Creech AFBs and the Nevada Test and Training Range. Implementing the CIP is a responsibility of the 99 ABW.

#### **Location of the Proposed Action**

Nellis AFB is located in the southeast corner of the state of Nevada and adjacent to the city of Las Vegas (Figure 1-1). Nellis AFB is the center for Air Combat Command's (ACC's) training and testing activities at the Nevada Test and Training Range (NTTR), with the base providing logistical and organizational support for NTTR, aircraft training, and personnel. Situated in Clark County, the base lies 5 miles northeast of the City of Las Vegas.

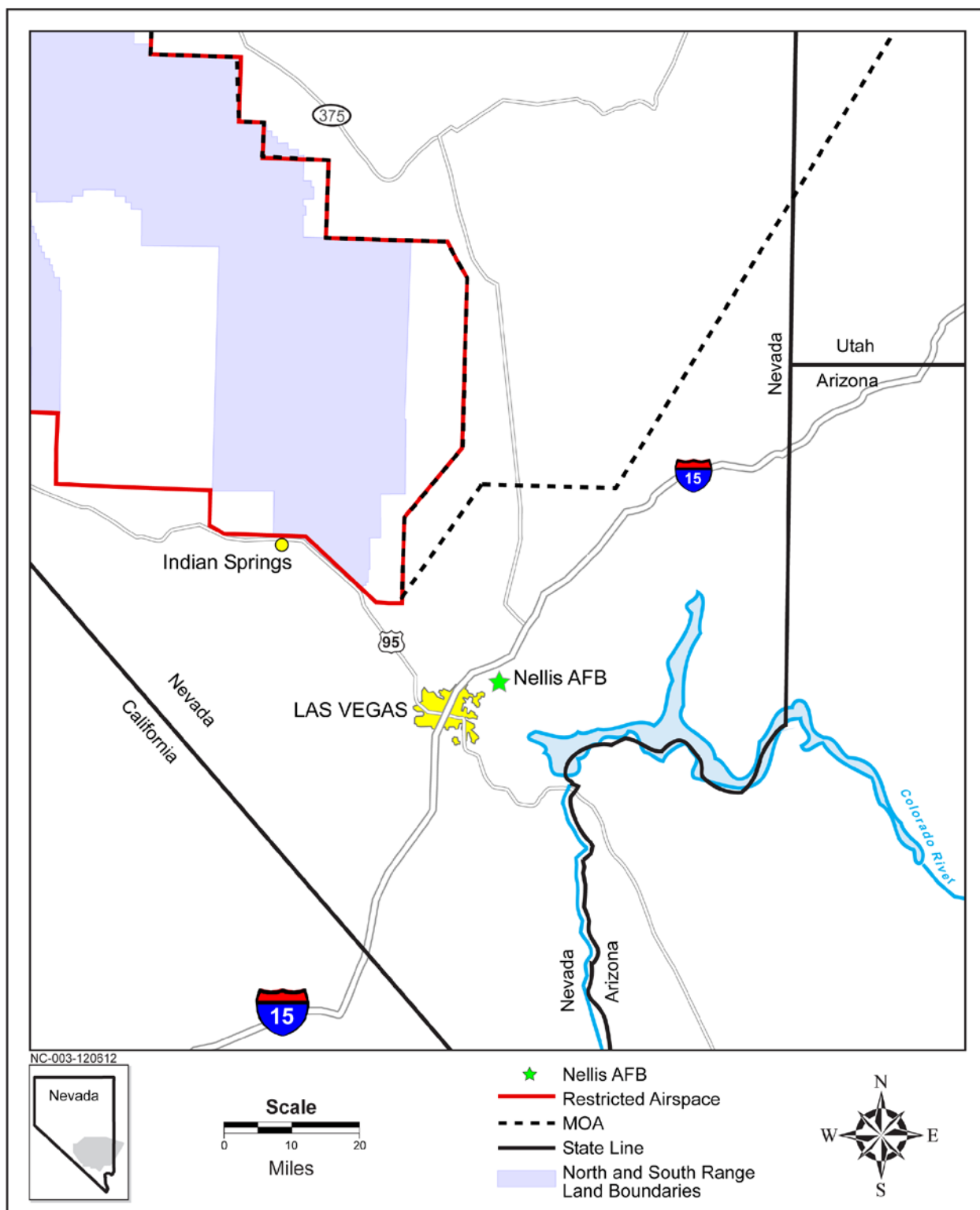


Figure 1-1. Nellis AFB Location Map

With approximately 10,000 military and civilian employees and covering 14,161 acres, the base includes facilities and infrastructure similar to a small city. There are 1,470 facilities and over 170 miles of roads and infrastructure. The Main Base is located east of Las Vegas Boulevard and includes the airfield and most base functions. Northeast of the main base lies the area used by the Red Horse Squadron and includes the Weapons Storage Area (WSA). Located across Las Vegas Boulevard, northwest of the Main Base, includes a number of facilities such as a hospital, storage, and housing. An additional 12,160 acres of the base lies north of Interstate 15 and is used as a small arms range.

The CIP includes projects located throughout the base. Although there are 29 current mission MILCON projects slated for ground-up construction, of which only two or less per year would be implemented, the majority of the projects would be renovation, repair and maintenance occurring on existing developed portions of each functional area of Nellis AFB. There are nine MILCON projects associated with the new F-35 mission that would involve ground-up construction.

### **1.3 PURPOSE AND NEED FOR ACTION**

The purpose of this update to the Nellis AFB CIP is to incorporate new projects into the current projects lists that are necessary to sustain the Base mission. With the implementation of asset management principles through the Base Comprehensive Asset Management Plan (BCAMP), as well as changes to the Installation Priority List (IPL) processes, the General Plan is no longer the primary force determining which projects are funded. However, the General Plan remains a tool for the Installation Commander to use in decision making and project prioritization.

As an integral element of the new project prioritization process, the General Plan, the CIP, and the BCAMP assist the Base Civil Engineer in recommending priorities to Wing leadership. Pulling information from legacy databases, the BCAMP transparently documents the current condition of base assets and assists making recommendations on asset maintenance based on the assets value to the base mission. With limited funding for the near future, prioritization and consolidation has become the norm. Not all facilities that need repair will get the needed attention due to its value to the base mission. Another component is the long range Sustainability, Restoration, and Modernization (SRM) funding. If consolidation continues, many of the facilities may be demolished before repairs are funded. The IPL is a composite priority list, produced by the BCAMP and previewed/approved by the five wings. Each wing analyzes their mission needs and prioritizes the list of projects necessary to maintain their mission capability. The five lists are combined to create a composite list for the installation. The Facility Utilization Board reviews and prioritizes the composite list to forward to the MAJCOM as the IPL.

The proposed update to the Nellis AFB CIP is needed to provide the installation and unit commanders with up-to-date development possibilities for the base and to assist planners in compliance with the overall vision of the respective missions of Nellis AFB. .

Additionally, CIP projects not only meet this need but also provide the necessary repairs and maintenance for restoration, modernization, and sustainment of facilities to keep the installation with up-to-date facilities enabling mission needs. CIP projects address facility conditions including plans for future activities such as construction, repair, maintenance, and demolition, following recommendations for architectural compatibility and landscaping.

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## **CHAPTER 2**

# **DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

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## **2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

### **2.1 PROPOSED ACTION**

Nellis AFB proposes to implement an update to the Capital Improvements Program for Nellis AFB. The update includes the CIP that describes discrete projects, such as major utility upgrades or construction of individual facilities. It also presents planned changes to enhance mission capability and correct space and/or infrastructure deficiencies. The goal of this EA is to analyze the projects defined in these components of the CIP and assess their potential impacts to the environment.

The following provides a description of the CIP and the types of activities planned by implementing the CIP. These planned activities represent the proposed action analyzed in this EA.

#### **2.1.1 Capital Improvements Program**

The projects described in the CIP are derived from the BCAMP. The BCAMP lists all of the proposed projects which have been identified as a bona fide need by the individual proponents of each action. These projects are reviewed by the Civil Engineering Facility Review Board and approved by the 99 ABW Commander based upon criteria including mission requirements, quality of life, degradation of existing facilities, and other factors. While the list includes hundreds of projects, funding for all of the projects to be completed in the next 5 years is not feasible because of the limited amount of funds available. These funding limitations are due to worldwide deployments and contingency operations; competing funding requests from other military installations; new missions such as the F-35A beddown; and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year. Projects that are not funded and still considered valid projects are carried over to the following fiscal year; in fact, many projects are still on the list that date back to the early 2000's or before and remain vitally needed for the installation. The complete list of CIP projects is provided in Appendix A.

New construction, additions, remodels, demolition, maintenance, and repair comprise types of projects on the ACES list and are further broken down by type, such as facilities, utilities, roads, airfield, administrative, recreation, and others. Table 2-1 identifies the improvement types of work, definitions and examples for improvements by the type of activity.

| <b>Table 2-1. Capital Improvements Identification by Activity Type</b> |   |   |
|--|---|---|
| <b>Activity</b>  | <b>Definition</b>   | <b>Examples</b>   |
| Construction   | New construction or addition, expansion, and renovation to existing facilities. All new construction must meet energy savings requirements. | Includes construction of buildings, roads, mission operation facilities, pads, access roads and parking lots and landscaping  |
| Repair/Replace   | Repair and/or replace existing equipment and infrastructure   | Repair equipment, parking lots, manhole covers, fences, sprinkler system, as well as fuel tanks; install exterior lighting, also includes replacing existing landscaping with xeriscaping |
| Installation   | Installation of equipment, signs, utilities etc. to enhance the functionality of existing infrastructure                                    | Install equipment to maintain operational mission such as emergency power, check valves, heating and air conditioning units, force protection, underwing foam system, and fire hydrants   |



| <b>Table 2-1. Capital Improvements Identification by Activity Type (con't)</b> |  |   |
|--|--|---|
| <b>Activity</b>  | <b>Definition</b>  | <b>Examples</b>   |
| Maintenance  | Routine maintenance  | Routine maintenance to landscaping, road/parking lot pavement, ramps, water tanks, and hangars                        |
| Demolish   | Demolition of existing infrastructure  | Demolish roads, aged dormitories, buildings, pads, etc., potentially not related to new construction                  |
| Environmental  | Monitoring and/or remediation of environmental spill sites, or other contracted documents such as Remedial Action Plans, Spill Response Plans, and Permit Fees | Long-term monitoring or planned remediation of identified sites, plans and permits which do not have physical impacts |

Table 2-2 identifies the infrastructure types existing on Nellis AFB and the variety of activities that are accomplished on each infrastructure type. For example, airfield improvements could involve construction, repair, maintenance, demolition, and perhaps, environmental remediation activities.

| <b>Table 2-2. Capital Improvements Identification by Infrastructure Type</b>                  |   |  |
|---|---|--|
| <b>Facility Type</b>  | <b>Definition</b>   | <b>Examples</b>  |
| Facilities  | Building construction or additions. This could include new, modular, addition/remodel, or storage facilities.                                   | Includes all of the difference classes of buildings; industrial, administrative, community service, etc. An example of a holding pad would be a munitions storage pad. |
| Airfield  | Maintenance, installation, and repair of airfield pavements and airfield related equipment  | Revetment, paint taxi lines, install runway shoulders, extend/repair flight line, maintain airfield pavement, and aircraft arresting systems                           |
| Utilities   | Installation and repair   | Repair and install communication, electrical, sewer, natural gas, and water lines, and water conservation projects.  |
| Roads   | Installation, repair or maintenance of roads, sidewalks and parking lots  | Roads, parking lots, etc. this also includes signal lights, roundabouts, and deceleration lanes.   |
| Security  | Installation, construction, repair or maintenance of Antiterrorism/Force Protection items designed to improve the security of the installation. | Fencing, security barricades, lighting, security cameras, and vehicle inspection areas. Vegetation clearing and perimeter roads could fall in this category.           |
| Fences/walls  | Perimeter structures primary for force protection and/or aesthetics   | Fences and block walls, includes dumpster enclosures, fence line lighting and security equipment   |
| Energy Conservation Improvement Program (ECIP) and <i>Greening of the Government</i> Projects | Installing and/or retrofitting systems and equipment which directly or indirectly result in energy savings                                      | Photovoltaic Arrays, window film, HVAC controls, day-lighting projects   |
| Recreation and quality of life projects   | Installing or repairing recreational areas, unit gathering places, or items to improve worker comfort and well-being                            | Volleyball courts, horseshoe pits, pavilions and BBQ areas   |

Further descriptions of various types of CIP activities include construction (MILCON) of current mission and future mission (primarily F-35A aircraft basing) facilities, restoration, modernization, and sustainment projects with definitions provided below.

**MILCON (Military Construction)** includes construction activity of sufficiently large scope to require Congressional funding and has the most potential for environmental impacts. All new facilities would be designed to comply with the Nellis AFB Design Compatibility Guidelines, August 2006, and major building projects would also comply with the Air Force Policy Memorandum requiring

Leadership in Energy and Environmental Design (LEED) Green Building Rating System as the Air Force preferred self-assessment metric. The standards require energy saving building techniques, supplies and equipment to reduce environmental impacts, and provide for energy savings from the construction and operation of these new facilities.

**Restoration** includes repair and replacement work to restore facilities damaged by inadequate sustainment, excessive age, natural disaster, fire, accident, or other causes, to such a condition that it may be used for its designated purpose.

**Modernization** includes alterations of facilities to implement new or higher standards, including regulatory changes to accommodate new functions (including new mission beddowns), or to replace building components that typically last more than 50 years.

**Sustainment** includes maintenance and repair activities necessary to keep an inventory of facilities in good working order. Sustainment includes deferred sustainment such as anticipated major repairs or replacement of components that occur periodically over the expected service life of the facilities.

Table 2-3 represents MILCON projects to support missions currently based and conducted from Nellis AFB such as Security Forces, Red and Green Flag, communications, and fire department. Due to the current budget limitations, very few MILCON projects that are not associated with major programs such as the F-35A program are expected to receive any funding. Although analyzed in the F-35A Force Development Evaluation (FDE) and Weapon School (WS) Environmental Impact Statement (EIS), Table 2-4 lists the F-35A MILCON Construction Projects. Tables 2-5 and 2-6 provide a list of the various O&M projects proposed for Nellis AFB that are the more likely projects to be funded and executed over the next few years. Table 2-5 lists the representative Restoration and Modernization projects, and Table 2-6 lists the Sustainment projects.

| <b>Table 2-3. Current Mission MILCON Projects</b> |  |                            |
|---|--|----------------------------|
| <b>Project Number</b>                             | <b>Project Title</b>                                 | <b>Infrastructure Type</b> |
| RKMF 03-3010                                      | Sound Suppressor Support Facility                    | Airfield                   |
| RKMF 03-3302                                      | Replace Dormitories 725, 727, & 729 (AT/FP)          | Facility                   |
| RKMF 03-3901                                      | Aircraft Explosives Cargo Parking Area               | Airfield                   |
| RKMF 05-3003                                      | Maintenance Facility (F-16)                          | Facility                   |
| RKMF 05-3004                                      | Multi-Purpose Maintenance Facility (Replace B283)    | Facility                   |
| RKMF 06-3002                                      | Consolidated Security Forces                         | Security                   |
| RKMF 06-3004                                      | Red Flag Facility                                    | Facility                   |
| RKMF 06-3010                                      | F/A-22 Munitions Support Facilities                  | Facility                   |
| RKMF 09-3020                                      | ECIP-HVAC Thermal Storage Ice Plant                  | Facility                   |
| RKMF 10-3003                                      | Communications Networks Control Center               | Facility                   |
| RKMF 10-3004                                      | Add/Alter Green Flag Facility                        | Facility                   |
| RKMF 10-3801                                      | Relocate Transformers and Switchgear                 | Utility                    |
| RKMF 11-3001                                      | TYPE III Hydrant Fueling System                      | Airfield                   |
| RKMF 11-3002                                      | F-16 Aggressor Airfield Pavements                    | Airfield                   |
| RKMF 11-3004                                      | Communication Support Center (Replace B295)          | Facility                   |
| RKMF 11-3005                                      | ADD RPA Weapons School Facility                      | Facility                   |
| RKMF 11-3006                                      | ADD/ALTER HH-60 General Purpose Maintenance Facility | Facility                   |
| RKMF 11-3010                                      | Community Fire Station                               | Facility                   |
| RKMF 11-3011                                      | AIRBORNE RED HORSE Flight Covered Storage Facility   | Facility                   |

|              |   |          |
|--------------|---|----------|
| RKMF 11-3012 | AIRBORNE RED HORSE Flight Operations Facility   | Facility |
| RKMF 11-3025 | Area Development Plan                           | Facility |
| RKMF 12-3004 | Adversary Tactics Analysis Center               | Facility |
| RKMF 12-3005 | 57 IAS Mission Operations Facility              | Facility |
| RKMF 12-3009 | HH-60 RECAP Operational Flight Trainer Facility | Facility |
| RKMF 12-3010 | Dormitory                                       | Facility |
| RKMF 14-3004 | Fire Station, Area III                          | Facility |
| RKMF 14-3005 | Fire Station, Area II                           | Facility |
| RKMF 14-3006 | JTAC Simulator Facility                         | Facility |

Note: Table acronyms listed in Appendix A

| <b>Table 2-4. Representative F-35A MILCON Construction Projects</b> |  |                            |
|---|--|----------------------------|
| <b>Project Number</b>   | <b>Project Title</b>                           | <b>Infrastructure Type</b> |
| RKMF 10-3005  | F-35 Alternate Mission Equipment (AME) Storage | Facility                   |
| RKMF 10-3006  | F-35 Parts Store                               | Facility                   |
| RKMF 10-3009  | F-35 Fuel Cell Hangar                          | Facility                   |
| RKMF 10-3011  | F-35A Munitions Maintenance Facilities         | Facility                   |
| RKMF 10-3012  | F-35A Weapons Load Training Facility           | Facility                   |
| RKMF 12-3007  | F-35A Weapons School Facility                  | Facility                   |
| RKMF 14-3001  | F-35A Maintenance Hangar/AMU                   | Facility                   |
| RKMF 14-3002  | F-35A Live Ordnance Loading Area               | Airfield                   |
| RKMF 14-3003  | F-35A Airfield Pavements                       | Airfield                   |

Note: Table acronyms listed in Appendix A

| <b>Table 2-5. Representative Restoration/Modernization Construction/Repair Projects</b> |   |                            |
|---|---|----------------------------|
| <b>Project Number</b>   | <b>Project Title</b>  | <b>Infrastructure Type</b> |
| RKMF 08-0013A   | Repair Fire Suppression System, Hangar 290, (F-16 MX)           | Utility                    |
| RKMF 98-0029  | Repair Fire Suppression System, Hangars 222, 224, & 226         | Utility                    |
| RKMF 14-0138  | Repair Interior Consolidated Support Facility (Bldg 20) Phase 1 | Facility                   |
| RKMF 12-0059  | Construct Shoulder Additions Aloha and Echo EORs                | Airfield                   |
| RKMF 11-0127  | Construct South Water Main to East Side (RED HORSE)             | Utility                    |
| RKMF 12-0051  | Repair Lighting, Buildings 262, 245, 61660, and 270             | Utility                    |
| RKMF 10-0072  | Repair Interior Legal Office, Building 18                       | Facility                   |
| RKMF 13-0125  | Repair Building 2364 or TACAN and Demolish Facility 2060        | Facility                   |
| RKMF 13-0089  | Repair/Reconfigure Dormitory 782 (IAW DMP)                      | Facility                   |
| RKMF 09-0131  | Relocate PAPI's on Taxiway Delta                                | Utility                    |
| RKMF 12-0126  | Taxiway Lights, N. LOLA Pad/Taxiway H/J                         | Airfield                   |
| RKMF 12-0039  | Repair Drainage Culvert Taxiway Alpha                           | Airfield                   |
| RKMF 11-0096  | Construct Flightline Fence                                      | Security                   |
| RKMF 13-0054  | Install FOD Cap at Runway 03R                                   | Airfield                   |
| RKMF 12-0003  | Repair Well #4, and Install Security Enhancements, Craig Rd     | Security                   |
| RKMF 10-0095  | Construct AVB, Beale Ave  | Security                   |
| RKMF 12-0106  | Seal all Cracks/Spall on Shoulders of Taxiways and Aprons       | Airfield                   |
| RKMF 11-0102  | Repair 19 WPS Vault/Mission Planning Cell, Bldg 282             | Facility                   |
| RKMF 14-0050  | Construct/Repair Parking Lots, Bldgs 2101, 425, and 2345        | Road                       |
| RKMF 14-0139  | Repair Interior Consolidated Support Facility (Bldg 20) Phase 2 | Facility                   |
| RKMF 14-0140  | Repair Interior Consolidated Support Facility (Bldg 20) Phase 3 | Facility                   |
| RKMF 08-0016  | Construct Storage Facility, Red Flag                            | Facility                   |
| RKMF 08-0017  | Construct Admin/Training Facility, Red Flag                     | Facility                   |
| RKMF 12-0127  | Repair HVAC Building 297 Support Section (Viper)                | ECIP                       |

Note: Table acronyms listed in Appendix A

**Table 2-6. Representative Sustainment Construction/Repair Projects**

| <b>Project Number</b> | <b>Project Title</b>  | <b>Infrastructure Type</b> |
|-----------------------|---|----------------------------|
| RKMF 12-0087          | Repair Fire Detection & Alarm Sys. Main Exchange, B431                                | Utility                    |
| RKMF 10-0019          | Repair Roofs: Red Flag, Hangar 290, Desert Oasis, T-bird                              | Facility                   |
| RKMF 10-0101          | Repair HVAC, Bldg 282   | ECIP                       |
| RKMF 13-0126          | Repair HV Switches, Main Base   | Utility                    |
| RKMF 01-0067          | Repair Roof, Bldg 625   | Facility                   |
| RKMF 13-0130          | Repair HVAC Network Control Center, BLDG 47   | Facility                   |
| RKMF 13-0129          | Repair Drainage Facilities 415, 447, 448, and 2097                                    | Facility                   |
| RKMF 10-0004          | Repair Water Tanks and Coat Interiors   | Utility                    |
| RKMF 09-0002          | Repair Water System, Area II  | Utility                    |
| RKMF 08-0035          | Repair HVAC, Red Flag Building 201  | ECIP                       |
| RKMF 13-0128          | Repair Multiple Roofs, Bldgs 47, 470, 66, 102, 118, 122, 250, 282, 284, 286, 415, 256 | Facility                   |
| RKMF 11-0123          | Maintain Interior Carpeting/Paint, Dorms 792/794, Dayrooms 783/793/795                | Facility                   |
| RKMF 08-0036          | Repair Overhead Switch with Pad Mounted Unit, Area II                                 | Utility                    |
| RKMF 08-6100          | Repair Drinking Water Main Dead-Ends, Tyndall Ave                                     | Utility                    |
| RKMF 12-0027          | Repair HVAC, Building 1114  | ECIP                       |
| RKMF 10-0149          | Repair Pavements, Runway 03R/21L  | Airfield                   |
| RKMF 06-6125          | Install Backflow Prevention Devices Various Facilities                                | Utility                    |
| RKMF 06-0124          | Repair Intersections Washington Blvd  | Road                       |
| RKMF 10-0105          | Repair Pavements, Fuel Barn   | Airfield                   |
| RKMF 09-6957          | Repair UST Auto Tank Gauging System   | Utility                    |
| RKMF 05-0033          | Install Fire Suppression Sys. CES Readiness Building 10136                            | Utility                    |
| RKMF 08-0085          | Repair Fire Suppression System, Dining Hall, Building 567                             | Utility                    |
| RKMF 07-6911          | Construct Transformer Containment Pad, Building 1043                                  | Utility                    |
| RKMF 07-0087          | Install Grounding Points, Main Parking Apron  | Airfield                   |
| RKMF 12-0128          | Repair Joint Seals Main Parking Apron   | Airfield                   |
| RKMF 15-0010          | Repair Hangar Doors, Corrosion Control (Building 256)                                 | Facility                   |
| RKMF 03-0142          | Repair Grounding System Control Tower, Building 2064                                  | Utility                    |
| RKMF 08-0071          | Repair HVAC, Base Ops Building 805  | ECIP                       |
| RKMF 08-0089          | Install Fire Suppression Control Tower, Building 2064                                 | Utility                    |
| RKMF 12-0129          | Repair Boiler Corrosion Control Facility 256  | Utility                    |
| RKMF 08-0014          | Repair Parking Lot for Aggressor Hangar/AMU   | Road                       |

*Note:* Table acronyms listed in Appendix A

The above lists the representative CIP projects that would be implemented by the proposed action by infrastructure type and classes of projects. The majority of the existing mission and F-35A MILCON projects would involve new construction, but most would occur on developed portions of the base. These are representative projects since only a few have a chance to get funded over the next several years. The F-35A MILCON projects are likely to get funded, but an EIS has already been prepared analyzing the environmental impacts of basing the F-35A at Nellis AFB. The Restoration and Modernization projects and the Sustainment projects are typically repair, replace or maintain existing facilities or infrastructure.

Since the lists are representative projects, two demolition/construction scenarios were developed to frame the proposal into the reasonable expectations of how much construction could be performed in any year assuming the current pace of project funding and execution. The light construction scenario, Scenario 1, modeled demolition of a two-story, 2,000 square-foot concrete building located on 1 acre of land, and 3 acres of construction for a 30,000 square-foot concrete maintenance shop with a 100,000 square-foot

parking lot. The heavy construction scenario, Scenario 2, increased demolition to 3 acres and tripled the sizes of the building and parking lot to be demolished. Construction under Scenario 2 tripled the sizes of the building and parking lot and the overall project disturbance area increased to 10 acres.

Repair/replace, installation, maintenance activities, typically involve equipment and very light incidental construction and generally are categorically excluded from NEPA analyses. In combination, a large number of these projects would be necessary to add up to the size limit of these scenarios. Small construction projects, singly or in combination with other small projects would generate impacts associated with Scenario 1. Only the largest projects or combination of numerous small projects would reach the size described in Scenario 3. These scenarios are typical construction examples used for guidelines but some projects may differ in scope and would be looked at individually. For example, a road widening project where most of the area is previous road bed may not require as intensive grading effort as a new road or building and could exceed ten acres.

## **2.2 METHODOLOGY FOR IDENTIFYING PROPOSED ACTION AND ALTERNATIVES**

The individual CIP projects proposed action and alternatives were identified through a process that examined the basic requirements for the action; the applicability of environmental, safety, security and exclusionary criteria that located actions at appropriate locations on base or eliminated actions from consideration; and the need for additional analyses. Actions in locations that were not compatible, violated environmental constraints (such as locations of threatened or endangered species) and require additional NEPA analysis, or have already been analyzed under NEPA, were not included within the proposed action and alternatives.

### **2.2.1 Basic Requirements and Exclusionary Criteria**

The basic requirements for assembling the CIP are to meet the 99 ABW Commander's vision for the future configuration of Nellis AFB. Planning needs to account for current and anticipated mission needs and yet still be flexible to accommodate changes to the mission. In the case of Nellis AFB, which is the home to the Weapons School, Red Flag, and the 53<sup>rd</sup> Test Wing, needs change frequently as airframes, tactics, equipment, and testing needs are constantly evolving. As the Air Force leaders in testing and training, Nellis AFB is at the forefront of these changes. There are some constants, which in many respects are the focus of this EA. Flight operations have to occur along the flight line, community services and dormitories are required. The following are some of the more notable constraints.

#### **Compatible Land Use**

Land use is the classification of either natural or human-modified activities occurring at a given location. Natural land use includes rangeland and other open or undeveloped areas. Human-modified land use classifications include residential, commercial, industrial, airfield, recreational, and other developed areas. Land uses at Nellis AFB are regulated by the 2006 General Plan, which designates land use categories and identifies the type and extent of land use allowable in specific areas and where environmentally sensitive areas need to be protected (Air Force 2006a).

### **Force Protection and Security Compliance**

As a result of terrorist activities, the Department of Defense (DoD) and the Air Force have developed a series of antiterrorism/force protection (AT/FP) guidelines for military installations. These guidelines address a range of considerations that include access to the installation, access to facilities on the installation, facility siting, exterior design, interior infrastructure design, and landscaping (Unified Facilities Criteria [UFC] 4-010-01, 2012). The intent of this siting and design guidance is to improve security, minimize fatalities, and limit damage to facilities in the event of a terrorist attack. The representative projects would be constructed in accordance with UFC 4-010-01 and would help improve AT/FP measures on the base.

### **Available Utilities and Infrastructure**

Facility location has considered the location of existing utilities and infrastructure and/or the capacity to readily extend to the new facility.

### **Compatibility with Explosive Safety Zones**

Defense Department Explosives Safety Board 6055.9-STD and Air Force Manual 91-201 Explosives Safety Standards define distances that need to be maintained between munitions storage areas and a variety of other types of facilities. These distances, called quantity-distance (QD) arcs, restrict or prohibit development based on the type and quantity of explosive material being stored.

### **Compatibility with Airfield Safety Zones**

The Nellis AFB Air Installation Compatible Zone (AICUZ) Study identifies Clear Zones (CZ) and Accident Potential Zones (APZs) as areas where an aircraft mishap is statistically most likely to occur. Base and local planning agencies are advised not to put incompatible uses within these zones.

### **Environmental Constraints**

Projects meeting the criteria would undergo numerous environmental constraints are discussed in detail in Chapters 3 and 4 of this EA. They include air quality, Environmental Restoration Program (ERP) sites, biological and cultural resources, hazardous materials and waste management, and aircraft noise zones.

## **2.3 ALTERNATIVES TO THE PROPOSED ACTION**

The CIP projects would provide the installation commander with overall list of projects that meet bona-fide mission needs and/or upgrading of degraded facilities or infrastructure for a selection to be funded and performed annually. The tables described above generally are listed in order of priority, but factors can alter the prioritization and determine the number of projects that can be performed. These factors include: emerging mission needs and requirements; the current condition of the facility or infrastructure; amount of budget available; and/or other requirements such as fulfilling environmental, safety, or security issues. Funding is always an issue and relatively few projects get implemented annually. In addition, work-arounds often get implemented in the interim and while the mission or upgrade project need still exists, these work-arounds can drop the priority while a different project may be elevated that can't be solved by a work-around. In other words, the CIP list reflects a dynamic priority as adjustments are continually made. As a result, the CIP projects list itself presents a myriad of alternatives of this action

and is impossible to definitively proscribe a set of alternatives. In reality, the proposed action would be that any of the CIP projects could be implemented. For these reasons, the light and heavy construction scenarios were developed to characterize the type of project and assess the impacts according to project size. The analysis would garner the similar conclusions for the proposed action if five or ten large projects are implemented as forty or more little projects. Therefore implementation the CIP represents a continual alternative selection process and no formal alternatives to the proposed action are presented in this EA.

## **2.4 NO-ACTION ALTERNATIVE**

Under NEPA and CEQ regulations (40 CFR Part 1502.14(d)), “no action” means that the proposed action (i.e., CIP updates for Nellis AFB) would not take place, and the resulting environmental effects from taking no action would be compared to the effects of permitting the proposed action to go forward. Under the no-action alternative, some projects would still occur but would require to be individually assessed and documented. NEPA also requires analysis of baseline conditions as reflected by the no-action alternative to compare the impacts to those resulting from the proposed action. The following descriptions of the current status of Nellis AFB provide a context for comparing the changes that would occur with implementing the proposed action.

### **Nellis AFB**

#### ***Mission Characteristics***

Nellis AFB is the “Home of the Fighter Pilot” and the USAFWC. The USAFWC provides advanced combat training, tactics development, and operational testing. As weapons systems, enemy capabilities, and world situations change, changes at Nellis AFB occur to ensure that the base and its training and testing missions produce the best trained and most capable aircrews in the world.

To fulfill its mission, Nellis AFB provides realistic combat training involving every type of aircraft in the Air Force inventory. It also supports test and evaluation programs and weapons schools for all Air Force fighter aircraft: A-10s, F-15C/Ds, F-15Es, F-16s, F-22As, and F-35As. The USAFWC, headquartered at Nellis AFB, consists of four wings and one named activity; two wings and the NTTR are based at Nellis AFB and two wings operate from Eglin AFB and Hurlburt Field, Florida. Table 2-7 summarizes the major units and their functions. In addition, Nellis AFB and the NTTR host and conduct large-force exercises for U.S. and allied air forces. During these exercises, many transient aircraft operate out of Nellis AFB using ramp space and other facilities.

| <b>Table 2-7. Nellis AFB Units Relevant to the Proposed Action</b> |  |
|--|--|
| <b>Unit</b>  | <b>Relevant Functions</b>  |
| USAFWC   | <ul style="list-style-type: none"> <li>Responsible for United States Air Force (USAF) operational testing, tactics development and advanced training in air, space and cyberspace at the operational and tactical levels.</li> <li>Manages all advanced pilot training and integrates test and evaluation requirements.</li> </ul>   |
| 57 Wing  | <ul style="list-style-type: none"> <li>The 57th Wing is the most diverse wing in the United States Air Force. It provides advanced aerospace training to world-wide combat air forces and showcases aerospace power to the world while overseeing the dynamic and challenging flying operations at Nellis. It manages all flying operations at Nellis Air Force Base and conducts advanced aircrew, space, logistics and command and control training through the USAF Weapons School, Red Flag and Green Flag exercises.</li> <li>The wing is comprised of seven distinct organizations: the 57th Adversary Tactics Group (ATG), 57th Maintenance Group, 57th Operations Group, USAF Weapons School, USAF Advanced Maintenance and Munitions Officers School, USAF Air Demonstration Squadron, and 561st Joint Tactics Squadron.</li> <li>Provides advanced realistic training in combined air, ground, and electronic threat environment.</li> <li>Trains graduate-level fighter aircrews for all fighter aircraft.</li> <li>Conducts large-force exercises involving combat training for multiple “friendly” and “adversary” forces.</li> </ul> |
| 99 ABW   | <ul style="list-style-type: none"> <li>Host wing for Nellis AFB.</li> <li>The wing provides installation support for more than 10,000 personnel assigned to Nellis AFB, Creech AFB, and the Nevada Test &amp; Training Range. Three groups are assigned to the wing: 99th Mission Support Group, 99th Medical Group and the 99th Security Forces Group.</li> </ul>   |
| NTTR   | <ul style="list-style-type: none"> <li>Operates, maintains, and develops NTTR comprising about 3 million acres of land and 12,000 square nautical miles (nm) of airspace.</li> <li>The Nevada Test and Training Range is responsible for the largest contiguous air and ground space available for military operations in the free world.</li> </ul>   |
| 53 Wing  | <ul style="list-style-type: none"> <li>Based at Eglin AFB, except for the 53rd Test and Evaluation Group.</li> <li>Responsible for operational testing and evaluation of new equipment and systems proposed for use by the forces.</li> <li>Develops new tactics for aircraft in the USAF inventory.</li> <li>Operates A-10, F-15C/E, F-16C, F-22A, HH-60G and the F-35A aircraft at Nellis AFB.</li> </ul>  |
| 505 <sup>th</sup> Command and Control Wing (CCW)                   | <ul style="list-style-type: none"> <li>The mission of the 505th CCW is to improve warfighter capability through command and control testing, tactics development and training.</li> </ul>  |

Although Nellis AFB is home to numerous flying missions, two of the more notable and enduring mission activities conducted from Nellis AFB are the Red Flag and the USAF Weapons School. These missions are not all-encompassing of Nellis activities; they typify the importance of Nellis AFB to the overall DoD and USAF missions.

**Red Flag:** The 414<sup>th</sup> Combat Training Squadron conducts large-force exercises that maximize the combat readiness and survivability of participants by providing a realistic training environment. Red Flag is a special multi-week large force exercise that realistically simulates aircrew deployment and combat situations. Red Flags are complex, full-scale simulated wars, complete with aggressor aircraft using adversary tactics. These exercises teach units how to deploy and operate in an integrated manner. In a typical Red Flag exercise, Blue Forces (friendly) engage Red Forces (aggressor) in combat situations. Blue Forces are made up of units from ACC, Air Mobility Command, U.S. Air Forces in Europe, Pacific



Air Forces, Air National Guard, U.S. Air Force Reserve, Army, Navy, Marine Corps, and allied air forces. They are led by a Blue Forces commander who orchestrates the employment plan. Red Forces are composed of the 57<sup>th</sup> ATG and provide the threats through the emulation of enemy tactics. In a typical year, the Air Force plans three to five Red Flag exercises at Nellis AFB and NTTR.

***Weapons School:*** Made up of 18 squadrons, 11 that are based at Nellis, the Weapons School provides graduate level training for tactical experts and leaders of airmen skilled in the art of integrated battle-space dominance across the land, air, space and cyber domains. Graduate of the USAF Weapons Schools provide instruction to instructors with tactical knowledge and lessons learned from deployed units, evaluating solutions in exercises, and formally preparing them for application across the force, the Weapons School provides a controlled learning environment and knowledge trust for best practices in air, space and cyber combat techniques.

***The 99 ABW*** is the host wing for Nellis AFB and provides support for all of the based and transient operations conducted at Nellis AFB. Three groups comprise the 99 ABW; the 99<sup>th</sup> Mission Support Group, the 99<sup>th</sup> Medical Group, and the 99<sup>th</sup> Security Forces Group (99 ABW Fact Sheet, 11/13/20120).

***The 99th Mission Support Group*** provides civil engineer, communications, contracting, logistics readiness, personnel, and services support for Nellis AFB, Creech AFB, and the Nevada Test and Training Range.

***The 99th Medical Group*** provides medical care to DoD beneficiaries and veterans to ensure maximum wartime readiness and combat capability. Functions include flight medicine, surgical services, inpatient services, outpatient clinics and specialty care, mental health services, dental care, pharmacy, laboratory, pathology, radiology, dietetic and nutritional medicine, medical benefits and information.

***The 99th Security Forces Squadron*** provides flight-line security, police services and antiterrorism/force protection for Nellis AFB and Creech AFB.

In the 99th Mission Support Group, the ***99<sup>th</sup> Civil Engineering Squadron*** provides maintenance, repair, design and construction support for facilities and infrastructure, fire protection and crash rescue, disaster preparedness, environmental compliance, explosive ordnance demolition and oversight for privatized military family housing. It is responsible for development and implementation of the base's General Plan, which includes the current CIP and the associated construction, repair and maintenance projects. A revision of the General Plan is currently underway.

### ***Facilities and Infrastructure***

Nellis AFB includes a well-developed infrastructure supporting a broad spectrum of functions and organizations. Covering 14,161 acres, the base consists of three functional areas (refer to section 1.2 and Figure 1-2). Area I, the main base, occupies about 30 percent of the base and contains runways, flight line, hangars, industrial facilities, housing, and administrative and support facilities and contains over 2,000 buildings, including more than 1,200 family housing units, dormitories, and billeting facilities. Area II covers approximately 60 percent of the base and houses Red Horse and the WSA. Area III covers about 10 percent of the base and includes most of the housing area and the O'Callaghan Medical Center. Area III also boasts the largest photovoltaic array on USAF property.

Supporting a population of over 10,000 active duty and civilian personnel, Nellis AFB has all the functional characteristics of a small city with housing, community support facilities such as the Base Exchange and the Commissary, medical clinic, pharmacy, officers and enlisted clubs, golf course, and several fitness centers. This is in addition to all of the support facilities of a major military airport including hangars, maintenance facilities, weapons handling facilities, fuel storage and dispensing systems, etc. Supporting all of these activities is an infrastructure network of communication lines, water pipelines, sewer lines, electrical lines, and gas lines. Since the base is over 60 years old, the condition of facilities and infrastructure range from old and degraded to new or nearly new; all require regular maintenance and repair.

## **2.5 REGULATORY COMPLIANCE AND PERMIT REQUIREMENTS**

This EA examines the specific affected environment for implementation of projects at Nellis AFB. The analysis considers the current conditions of the affected environment, and compares those to the no-action alternative. It also examines the cumulative impacts within the affected environment at each of these locations as well as past, present, and reasonably foreseeable actions of the Air Force and other federal, state, and local agencies. The NEPA process is intended to assist the decisionmaker in understanding the environmental consequences and in taking appropriate actions that protect, restore, and enhance the environment. Other federal statutes that may apply to the proposed action are listed in Table 2-8.

### **Stormwater**

Under the proposed action, the Nellis AFB water quality program manager would update applicable base permits and assist in obtaining all stormwater-related permits for new construction. Nellis AFB would need to reevaluate its National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plans (SWPPP) to ensure compliance.

### **Permits**

Should the proposed action be implemented, the Air Force would need to obtain new or update existing permits. These permits would apply to the removal and disposal of asbestos as a result of demolition of, or modifications to facilities; construction of new facilities; and stormwater discharge permits.

### **Asbestos and Lead-Based Paint Removal and Disposal**

Prior to demolition or additions to buildings, asbestos surveys are required by Air Force regulation. For the removal of asbestos, a notification process with Clark County, the state health board, the U.S. Environmental Protection Agency (EPA), and the base asbestos and lead-based paint (LBP) coordinator is required. Removal would be contracted out to state-certified and licensed contractors. Contractors would obtain the necessary permits for the removal, handling, and transportation of asbestos. Contractors must have access to a permitted landfill for disposal of asbestos.

**Table 2-8. Other Major Environmental Statutes, Regulations, and Executive Orders  
Applicable to Federal Projects**

| <b>Environmental Resource</b>       | <b>Statutes</b>  |
|-------------------------------------|--|
| Noise                               | Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609); EPA, Subchapter G-Noise Abatement Programs (40 CFR 201-211)  |
| Air                                 | Clean Air Act (CAA) of 1970 (PL 95-95), as amended in 1977 and 1990 (PL 91-604); EPA, Subchapter C-Air Programs (40 CFR 52-99)   |
| Environmental Justice               | Executive Order 12898-Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations; Protection of Children from Environmental Health Risks and Safety Risks (Executive Order 13045)  |
| Water                               | Federal Water Pollution Control Act of 1972 (PL 92-500) and Amendments; Clean Water Act (CWA) of 1977 (PL 95-217); EPA, Subchapter D-Water Programs (40 CFR 100-145); Water Quality Act of 1987 (PL 100-4); EPA, Subchapter N-Effluent Guidelines and Standards (40 CFR 401-471); Safe Drinking Water Act of 1972 (PL 95-923) and Amendments of 1986 (PL 99-339); EPA, National Drinking Water Regulations and Underground Injection Control Program (40 CFR 141-149)  |
| Biological Resources                | Migratory Bird Treaty Act of 1918; Fish and Wildlife Coordination Act of 1958 (PL 85-654); Sikes Act of 1960 (PL 86-97) and Amendments of 1986 (PL 99-561) and 1997 (PL 105-85 Title XXIX); Endangered Species Act (ESA) of 1973 (PL 93-205) and Amendments of 1988 (PL 100-478); Fish and Wildlife Conservation Act of 1980 (PL 96-366); Lacey Act Amendments of 1981 (PL 97-79)  |
| Wetlands and Floodplains            | Section 401 and 404 of the Federal Water Pollution Control Act of 1972 (PL 92-500); EPA, Subchapter D-Water Programs 40 CFR 100-149 (105 ref); Floodplain Management-1977 (Executive Order 11990); Emergency Wetlands Resources Act of 1986 (PL 99-645); North American Wetlands Conservation Act of 1989 (PL 101-233)   |
| Cultural Resources                  | National Historic Preservation Act of 1966 (16 USC 470 et seq., PL 89-665) and Amendments of 1980 (PL 96-515), 1992 (PL 102-575), and 2006 (PL 109-453); Protection and Enhancement of the Cultural Environment-1971 (Executive Order 11593); Indian Sacred Sites-1966 (Executive Order 13007); American Indian Religious Freedom Act of 1978 (PL 94-341); Antiquities Act of 1906; Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-470mm; Public Law 96-95); Native American Graves Protection and Repatriation Act of 1990 (PL 101-601); Protection of Historic Properties (36 CFR Part 800); Preserve America (EO 13287) |
| Solid/Hazardous Materials and Waste | Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-5800), as Amended by PL 100-582; EPA, subchapter I-Solid Wastes (40 CFR 240-280); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 USC 9601) (PL 96-510); Toxic Substances Control Act (PL 94-496); EPA, Subchapter R-Toxic Substances Control Act (40 CFR 702-799); Federal Insecticide, Fungicide, and Rodenticide Control Act (40 CFR 162-180); Emergency Planning and Community Right-to-Know Act (40 CFR 300-399)  |

**Construction:** For new buildings, the base would submit plans and a request for location to the Nellis AFB zoning and development board. An air quality dust permit must be obtained from Clark County if construction at any site causes 0.25 acres or more of topsoil disturbance, trenching of 100 feet or more, or demolition of structures 1,000 square feet or more. Shoulder stabilization instead of paving must be maintained in compliance with the stabilization standards in section 9.3.2.1.5 of the Clark County Air Quality Regulations. Nellis AFB would apply for a Clark County Surface Disturbance Permit after finalization of the building footprints and prior to construction. An Authority to Construct permit is required for construction projects, whereas, demolition projects require completion of a Clark County Demolition Notification form. Additionally, all proposals for removing or altering existing facilities

would be reviewed by the Nellis AFB Cultural Resources Manager to determine and implement the appropriate consultation requirements.

***Nellis AFB Plans and Protocols:*** In addition to the federal, state, and local regulations, Nellis AFB implements its environmental programs through various plans and protocols (Table 2-9). All of these plans conform to requirements defined in federal regulations and guidance. Project managers would coordinate with Nellis AFB Environmental Flight (99 CES/CEIE) to ensure compliance with all local, state, and federal environmental regulations.

| <b>Table 2-9. Nellis AFB Environmental Plans</b> |   |              |
|--|---|--------------|
| <b>Resource Area</b>                             | <b>Title</b>  | <b>Date</b>  |
| Cultural Resources                               | Integrated Cultural Resources Management Plan   | 2012         |
| Air Quality                                      | Nellis AFB Air Emissions Inventory  | 2011         |
|  | NTTR Air Emissions Inventory  | 2009         |
| Environmental Restoration Program                | Environmental Restoration Plan. Management Action Plan  | 2004         |
| Noise, Land Use and Planning                     | Air Installation Compatible Use Zone Study  | 2010 (draft) |
|  | General Plan for Nellis AFB, Nevada. Includes General Plan Summary for Indian Springs Air Force Auxiliary Field | 2006         |
| Asbestos   | Asbestos Management and Operations Plan   | 2003         |
| Lead-Based Paint                                 | Lead-based Paint Management Plan  | 2003         |
| Environmental Emergencies                        | Facility Response Plan  | 2011         |
| Hazardous Waste                                  | Hazardous Waste Management Plan   | 2010         |
| Hazardous Materials                              | Hazardous Materials Management Plan   | 2010         |
| Natural Resources                                | Integrated Natural Resources Management Plan  | 2010         |
| Stormwater                                       | Storm Water Pollution Prevention Plan   | 2010         |

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## **CHAPTER 3**

### **DESCRIPTION OF THE AFFECTED ENVIRONMENT**

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## **3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

### **3.1 INTRODUCTION**

NEPA requires focused analysis of the areas and resources potentially affected by an action or alternative. It also provides that an EA should consider, but not analyze in detail, those areas or resources not potentially affected by the proposal. Therefore, the Air Force must provide sufficient detail and depth of both description and analysis in this EA to allow decisionmakers and the public to differentiate among the alternatives.

This EA focuses on those resources that would be affected by proposed facility and infrastructure construction, additions, remodels, demolition, maintenance, and repair CIP projects at Nellis AFB. The analysis considers the current conditions of the affected environment at Nellis AFB and compares those to conditions that might occur with implementation of projects that have not been addressed in previous NEPA documents.

#### **3.1.1 Affected Environment**

The proposed action affects the areas defined by Nellis AFB. Evaluation and analysis of the proposed projects indicate that resources subjected to ground disturbing activities have the greatest potential to be affected particularly areas that have not been previously disturbed. These areas could contain natural and cultural resources, disturbance can cause air quality impacts, and paving open areas decrease impervious areas limiting groundwater recharge and can cause greater stormwater runoff. The potential environmental impact of implementing the CIP projects on Nellis AFB will be discussed in detail under each of the affected resources in Chapter 4; Environmental Consequences.

#### **3.1.2 Resources Analyzed**

Based on the components of the proposed action, the Air Force defined the environment potentially affected by construction or renovation projects at Nellis AFB. This definition focused on specific resource categories. As a result of this review, ten resource categories are evaluated: land use and transportation; infrastructure; socioeconomics; cultural resources; biological resources; water and soil resources; air quality; hazardous materials and waste; safety; and noise.

#### **3.1.3 Resources Eliminated from Further Analysis**

The Air Force assessed numerous resources for potential to be affected by the proposed action or no-action alternative. In accordance with CEQ regulations, this evaluation determined two resources did not warrant further examination in the EA: 1) visual resources, and 2) environmental justice and protection of children.

#### **Visual Resources**

The Air Force anticipates no negative effects on or conflicts with visual resources as a result of the proposed projects for Nellis AFB. The justification is that construction and/or improvement projects would: 1) take place on the installation and would be consistent with the existing visual landscapes; 2) primarily occur in the developed portion of the installation; 3) be built of similar materials as other structures on the installation; and 4) be landscaped consistent with the existing habitat. For these reasons,



implementation of the proposed action or no-action alternative would not have an adverse impact to the visual environment at Nellis AFB or the lands surrounding the installation.

### **Environmental Justice and Protection of Children**

Environmental justice addresses the disproportionate effect a federal action may have on low-income or minority populations. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* ensures the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The existence of disproportionately high and adverse impacts depends on the nature and magnitude of the effects identified for each of the individual resources. The affected area includes locations of proposed projects within the confines of Nellis AFB. Local emissions from construction activities would not approach any state or federal thresholds for the protection of human health and safety (see Section 3.8, Air Quality).

In 1997, Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children)*, was issued to ensure the protection of children. The proposed CIP projects at the base would not pose environmental or safety risks to children due to the fact that changes and improvements would be limited to the administrative, industrial, and/or operational areas on Nellis AFB. Access by the general public is prohibited and procedures prevent children from visiting these areas on the base. In summary, since there would not be a disproportionately high or adverse impact to minority or low-income groups and no aspect of the proposed action or no-action alternative would increase the health or safety risk to children, further analysis of environmental justice and protection of children as a resource was eliminated from further analysis.

## **3.2 LAND USE AND TRANSPORTATION**

Land can be used for residential, commercial, industrial, agricultural, transportation, recreational, or conservation purposes. Management plans, policies, ordinances, and regulations determine the manner in which a specific tract of land may be used. The status of land ownership is the primary driver that determines appropriate land use in a specific area. Nellis AFB is an Air Force military reservation. Thus, appropriate land use is primarily determined by federal laws, DoD directives, and Air Force policy and instructions. Transportation refers to roadway and street systems and the movement of vehicles on roadway networks on base and off-base feeder routes and intersections.

### **Affected Environment**

Nellis AFB includes developed and undeveloped lands. Main categories of developed land uses include airfield; industrial support areas; administrative services areas; and housing, recreation, and services areas. Undeveloped lands are commonly called open space in planning documents and may include natural or cultural resources preservation sites, safety buffers, or other similar land uses. The affected environments are the locations proposed for CIP projects on Nellis AFB.

### ***Land Use***

Nellis AFB includes a well-developed infrastructure supporting a broad spectrum of functions and organizations. It is composed of 14,161 acres (refer to Figure 1-2) divided into three areas: Area I, the Main Base; Area II; and Area III.

Area I is located east of Las Vegas Boulevard and contains 30 percent of the total base land area. Area I contains the greatest variety of land use activities, including runways, industrial facilities, housing areas, and most of the base's administrative, training, and support facilities. There are more than 2,000 buildings that include family housing units (enlisted and officers), dormitories, and billeting facilities. Area II is located northeast of the Main Base and accounts for 60 percent of the total base land area. The majority of Area II is undeveloped acreage. RED HORSE and Security Forces are the primary occupants of the developed acreage. West of Las Vegas Boulevard is Area III, containing 10 percent of the total base land area. The majority of base family housing units and recreational facilities are located in Area III. Area III also houses the Mike O'Callaghan Medical Center Campus which occupies the hospital facilities vacated by the Veterans Administration. The northwest portion of Area III is undeveloped where the Las Vegas bearpoppy, a special status plant species, can be found. A large solar photovoltaic array covers much of the remaining undeveloped space in Area III.

Industrial and open space accounts for about 39 and 36 percent of all Nellis AFB land, respectively. Most of the area designated as industrial is mandatory open space to provide safety zones around munitions storage or similar facilities. Table 3-1 provides a summary of existing land use on Nellis AFB.

| <b>Table 3-1. Existing Land Use at Nellis AFB</b> |                    |                   |
|---|--------------------|-------------------|
| <b>Land Use Category</b>                          | <b>Designation</b> |                   |
|   | <b>Acreage</b>     | <b>% of Total</b> |
| Airfield  | 1,275              | 10                |
| Aircraft Operations and Maintenance               | 406                | 4                 |
| Industrial  | 6,338              | 39                |
| Administrative                                    | 80                 | 2                 |
| Community (Commercial)                            | 61                 | <1                |
| Community (Service)                               | 70                 | 1                 |
| Medical   | 46                 | <1                |
| Housing (Accompanied)                             | 401                | 3                 |
| Housing (Unaccompanied)                           | 73                 | <1                |
| Outdoor Recreation                                | 740                | 4                 |
| Open Space  | 6,045              | 36                |
| Water   | 5                  | <1                |
| <b>Total</b>                                      | <b>15,540</b>      | <b>100</b>        |

*Source: Air Force 2006a*

### ***Transportation***

Most of the 147 miles of paved roads on the base meet at intersections controlled by stop signs; no traffic lights exist on base. This can cause minor traffic delays at these intersections. Traffic circles to facilitate vehicle flow have been planned, however, only one exists at the intersection of Ellsworth Avenue and Fitzgerald Boulevard. Unpaved roads are located in Areas II and III, with the majority located along the

perimeter of the base. They are minimally used for fence maintenance and security. Roadway pavements were given an “adequate” rating by the 2011 Headquarters (HQ) ACC Infrastructure Assessment (Air Force 2011b).

### **3.3 INFRASTRUCTURE**

The term infrastructure in this analysis refers to the delivery of basic services such as potable water, wastewater treatment, electrical and natural gas utilities, and solid waste management systems essential to the functioning of an Air Force base in support of its respective mission.

#### **Affected Environment**

For this EA, infrastructure resources within the boundaries of Nellis AFB constitute the affected environment. Information contained in this section was derived from the 2011 HQ ACC Infrastructure Assessment and the 2006 Nellis AFB General Plan and has been updated for current conditions. The 2011 HQ ACC Infrastructure Assessment shows that Nellis AFB overall has adequate infrastructure resources that pose no constraints for development, however there are a few resources that are degraded and require maintenance and repair.

#### ***Water Systems***

Piped surface and ground water support base personnel and operations. This includes water for drinking, sewage systems, fire utilities, maintaining landscapes, and construction. All water sources for Nellis AFB meet EPA and State of Nevada standards. Nellis AFB’s potable water sources include five active government-owned and operated wells and water purchased from Southern Nevada Water Authority via bulk-supply pipelines from Lake Mead. A small quantity is also purchased from the City of North Las Vegas Water District. Nellis AFB is allotted 7.1 million gallons per day (gpd) of surface and ground water (Air Force 2006a). Nellis AFB average daily water usage varies between 3.6 million gpd from October through April and 7 to 8 million gpd from May through September. There are nine potable water storage tanks on Nellis AFB with a total capacity of is 7.5 million gallons. According to the 2011 HQ ACC Infrastructure Assessment, some components of the Nellis AFB water supply distribution system and wells are considered deteriorated. Improvements since the 2006 assessment include replacement of two cast iron water mains and repair of one well, but are offset by continued deterioration of the cast iron pipes on the main base and in Area II, and of three wells and four water storage tanks. The infrastructure assessment recommends installation of backflow prevention equipment, replacement of aging wells and tanks, and replacement of deteriorated cast iron piping are required to update the existing system (Air Force 2011b).

#### ***Wastewater Systems***

Nellis AFB discharges approximately 1.5 million gpd of sanitary sewage from the base to the Clark County Water Reclamation District. This equates to about 90 to 95 percent of the base sanitary sewage. Industrial wastewater (i.e., aircraft wash water) from the flight line is also discharged through the sanitary sewer system to the Clark County Water Reclamation District with the sanitary wastewater.

Approximately 496,000 linear feet (LF) of sewer pipeline is maintained by the base for collection and transfer of wastewater from housing, offices, shops, the hospital, and flight line areas. Septic tanks, not connected to the sewage collection system, are used for remote buildings on the base. The 2011 HQ ACC Infrastructure Assessment rated the base's sanitary sewer collection system as "degraded" primarily due to problems with hydraulic overloading in several areas of the system and with 10 small pumping stations (Air Force 2011b).

### ***Electrical Systems***

Electrical power is distributed throughout the base via approximately 700,000 LF of above-ground cable, and another 1.2 million LF of underground cable. Pole and pad-mounted transformers step down the 12.47 kilovolts (kV) power to the voltages that are required by the various facilities. A 14.5 megawatt photovoltaic array and privatization of military family housing have considerably lessened the load on the two main substation transformers, eliminating an overload problem. The electrical systems were rated "adequate," but concerns remain with the 15 kV switching station at the main substation and the transformer vault at the Thunderbird Hangar (Air Force 2011b).

### ***Stand-by Power***

A back-up system comprised of 65 fixed generators and an additional 8 mobile generators provides power for contingency or emergency operations. The average age of the fixed generators is currently 5.9 years; the life expectancy is 20 years. A base-wide program to replace outdated and deteriorating generator units ensures the base has a reliable source of back-up power (Air Force 2011b).

### ***Natural Gas Distribution***

A supply line distributes gas to areas of the base via approximately 200,000 LF (almost 40 miles) of 100 percent polyethylene pipelines. The primary source of heating fuel on the base is natural gas. The base maintains three 1,000-cubic-foot cylinder tanks of natural-gas storage to refuel government vehicles. Supply from the company will be adequate to meet existing and projected demand. The natural gas distribution system on the base has been rated "adequate" (Air Force 2011b).

### ***Storm Drainage***

Stormwater in all areas of Nellis AFB generally flows to Clark County Regional Flood Control District channels to the southeast where it is routed into the Las Vegas Wash. Stormwater runoff is drained by three outfalls—one each in Area I, Area II, and Area III. Outfall 001 in Area I drains the main base and comprises 10,760 acres of on-base property. Outfalls 002 and 003 consist of small brooks and swales. Under the Clean Water Act (CWA), facilities that discharge stormwater associated with industrial activity must apply for a stormwater permit. The EPA delegated permitting authority to the State of Nevada. Nellis AFB has authorization under Nevada Department of Environmental Protection (NDEP) General Permits No.NVR050000 and GNV0022233-2004 to discharge its stormwater through the base's three outfalls. The storm drainage system is considered adequate and can support future development on the base (Air Force 2011b).

### ***Heating, Ventilation, and Air Conditioning***

Each facility on the base is equipped with its own heating and cooling system. The hospital complex is supported by a central energy plant (CEP), located in Building 1301. The CEP has a heating capacity of 26 million British thermal units (BTUs) and is fueled by three high-pressure natural gas steam boilers. The 2011 HQ ACC Infrastructure Assessment rated the base's heating and cooling systems as adequate (Air Force 2011b).

### ***Fuel Systems***

Jet fuel (JP-8) is provided by Kinder-Morgan, located just north of the Nellis AFB Bulk Fuel Storage Tank facility. Nellis AFB manages one bulk storage system with four JP-8 field-erected aboveground tanks, with a total of 47,400 barrels or 1,990,800 gallons. Nellis AFB also manages two JP-8 operating storage tank facilities, the West Transient Ramp Type III Hydrant System and the Eastside Revetment modified Type III Hydrant System.

The West Transient Ramp system includes two 10,000 barrel field-erected tanks with six aircraft refueling fillstands and nine aircraft fueling outlets. This facility receives fuel from the four Bulk Operating Storage tanks, just outside of the north gate. Fuel is supplied through an 8-inch, cathodically protected, carbon steel pipeline that is approximately 9,000 LF length.

The Eastside Revetment receives fuel from the Kinder-Morgan Contractor-Owned-Contractor-Managed 24,000 LF 8-inch pipeline that runs from their main storage facility outside of the north gate around the north perimeter of the Main Base to their two 10,000 barrel bulk storage tanks. A 6-inch cathodically protected carbon steel line, which runs approximately .75 miles, connects the Kinder-Morgan tanks to the base's four 25,000 gallon operating storage tanks. These four tanks feed fuel to 25 fighter revetments and three bomber pads through a combination of single-wall fiberglass reinforced plastic pipeline and cathodically-protected carbon steel pipeline, approximately 13,000 LF in length.

For the Air Force pipelines, leak detection is provided through buried soil vapor probes, located every 20 feet along the entire length of the pipeline and is tested annually by a third-party contractor. Kinder-Morgan also performs periodic testing of their pipeline, but this testing is performed in-house. The base also has seven commercial and government fuel stations at Nellis AFB that provide unleaded, diesel, bio-diesel, and JP-8 products. Combined storage capacity of all fuel products on Nellis AFB, to include underground storage tanks, aboveground storage tanks, and electrical transformers, was calculated at approximately 3.3 million gallons in the August 2011 *Nellis AFB Facility Response Plan*, not including 840,000 gallons of storage capacity in the newly installed Kinder-Morgan tanks. The 2011 HQ ACC Infrastructure Assessment rated the base fuel systems "degraded", with repairs required on the East Side Hydrant System and the Department of Energy Ramp Hydrant System (Air Force 2011b).

### ***Airfield Pavements***

Airfield pavement systems consist of runways, taxiways, aprons, revetment areas, helicopter pads, and miscellaneous hangars accesses and pavement pads. The existing airfield pavement systems are currently adequate; however, because the pavement systems consist of concrete and asphalt which can deteriorate from both load and climatic conditions, constant repairs and routine maintenance are required (Air Force 2011b).

### ***Airfield Lighting***

The airfield lighting system consists of standard runway and taxiway edge lighting systems with full approach lighting on both ends of Runway 03R/21L. The lights are controlled from the airfield lighting vault with a standard control system linked by cable to the control tower. The overall airfield lighting system is in good condition and was rated “adequate” (Air Force 2011b).

### ***Fire Protection Systems***

Since the 2006 HQ ACC Infrastructure Assessment, some deficiencies have been corrected by installing fire suppression systems in a few hangars, while others have been funded. However, several hangars still don’t have sufficient fire suppression, and many facilities have antiquated fire alarm systems and other life safety deficiencies. The unsatisfactory score for these life safety codes leads to a “degraded” rating for fire protection systems overall (Air Force 2011b).

### ***Roofing Systems***

Major repairs are needed on a few roofs, while many need only routine maintenance. Some funding for upgrades and repairs has occurred since the last headquarters assessment, but the roofing systems rating remains “degraded” (Air Force 2011b).

### ***Corrosion Control Systems***

No corrosion control funding has occurred since the 2006 infrastructure assessment and the system rating remains “degraded.” The major contributors to the degraded rating are damage or failure to individual water tank cathodic protection systems, and lack of corrosion control on an indeterminate number of natural gas piping risers (Air Force 2011b).

## **3.4 SOCIOECONOMICS**

Socioeconomics is defined as the social and economic activities associated with the human environment, particularly population and economic activity. Economic activity typically includes employment, personal income, and industrial growth. Impacts on these two fundamental socioeconomic indicators can also influence other components such as housing availability and public services.

Socioeconomic data are presented at the county level in order to analyze baseline socioeconomic conditions in the context of county trends. Data have been collected from previously published documents issued by federal, state, and local agencies; from state and national databases (e.g., U.S. Census Bureau (USCB); University of Nevada Center for Business and Economic Research; and from Nellis AFB (e.g., the base’s Public Affairs Office).

### **Affected Environment**

Analyses of impacts to socioeconomic characteristics potentially resulting from implementation of CIP projects requires establishment of an affected environment – a primary geographical area within which direct and secondary socioeconomic effects would be noticed. The primary focus for socioeconomic affect for Nellis AFB is Las Vegas Valley.

Analyses of impacts to socioeconomic characteristics potentially resulting from implementation of the proposed action require establishment of an affected environment – a primary geographical area within which direct and secondary socioeconomic effects of the Nellis AFB proposed action and alternative actions would be noticed. Because direct socioeconomic effects associated with implementation of the alternatives actions would occur in the immediate vicinity of Nellis AFB and since infrastructure resources are generally influenced by the socioeconomic environment, the primary focus of this analysis is Clark County.

Nellis AFB is among the area's largest employers with a workforce that totaled 14,759 personnel in 2010 (Air Force 2010a). The types of personnel included 9,410 active duty military, 983 Reserve/Air National Guard, 3,435 non-appropriated contract civilians and private business employees, and 931 appropriated civilians. The total annual payroll expenditures in 2010 were more than \$1.1 billion. Further, the Air Force estimates that the economic stimulus of Nellis AFB created approximately 6,416 secondary jobs in the civilian economy generating nearly \$255 million in the local region. Nellis AFB also purchased considerable quantities of goods and services from local and regional firms. Construction costs, service contracts, materials, supplies, and equipment for the base totaled over \$3.1 billion. Also generating substantial economic activity are over 27,750 military retirees who receive and spend payrolls exceeding \$645 million in the region (Air Force 2010a). In total, Nellis AFB contributed over \$5.1 billion to the local economy in 2010 (Air Force 2010a). As one of the single largest government employers in Clark County, Nellis AFB and its continuing operations represent a significant source of regional economic activity.

The population growth in Clark County has slowed from the boom years of the early 2000s, and construction employment has slowed proportionally (University of Nevada Las Vegas [UNLV] 2011). The University of Nevada, Las Vegas' Center for Business and Economic Research's Clark County Construction Index has maintained a steady slide, showing continued weakness in this hard-hit sector of the Southern Nevada economy. The index has fallen approximately 70 percent from its January 2007 value (UNLV 2011). Until there is sustained population growth to absorb excess real estate inventories, low levels of construction activity are likely to persist.

### **3.5 CULTURAL RESOURCES**

Cultural resources management is directed by federal laws. Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that federal agencies take into account the effects of their undertakings on historic properties, which are locations, features, and objects older than 50 years and determined eligible for nomination to the National Register of Historic Places (NRHP). Section 101(d)(6)(A) of the NHPA provides that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the NRHP.

A cultural resource is a location of human activity, occupation, or use that is more than 50 years old and is identifiable through inventory, historical documentation, or oral evidence. A historic property is a resource that has been determined to be eligible for listing on the *National Register of Historic Places*. Cultural resources include archaeological, historic, architectural, structural, places, artifacts, and objects. Archaeological resources can be classed as either sites or isolates and may be either prehistoric or historic

in age. Isolates often contain only one or two artifacts, while sites are usually larger and contain more artifacts.

Architectural resources are standing buildings, dams, canals, bridges, and other structures. Traditional cultural properties are resources associated with the cultural practices and beliefs of a living community that link that community to its past and help maintain its cultural identity. Traditional cultural properties may include archaeological resources, locations of historic events, sacred areas, sources of raw materials for making tools, sacred objects, or traditional hunting and gathering areas.

### **Affected Environment**

The affected environment for cultural resources includes the Air Force-managed land within the boundaries of Nellis AFB where construction or renovation projects under the proposed action could have an impact.

Methods for inventory and evaluation are described in Attachment A of the 2010 Integrated Cultural Resources Management Plan (Air Force 2012a). Efforts to identify and evaluate cultural resources properties for this project according to 36 CFR 800.4 were initiated in 1978 and continue to the present. Nellis AFB initiated a Native American Program in 1996 as a foundation for government-to-government consultation. Activities have included Annual Meetings, NTTR field trips, participation in professional meetings, and the formation in 1999 of a Document Review Committee which reads and comments on cultural resources reports prior to State Historic Preservation Office (SHPO) reviews.

### ***Archaeological Resources***

All of Nellis AFB, which includes Area I, Area II, and Area III, and the Small Arms Range, has been surveyed for archaeological resources and all sites evaluated. One NRHP-eligible site, a quarry, is located on Nellis AFB. All other sites were determined through SHPO consultation (letter dated April 12, 2001) to be ineligible for nomination. The Nevada SHPO has concurred with these determinations (Nevada SHPO 2001).

### ***Architectural Resources***

Page and Turnbull (1988) completed an inventory and evaluation of World War II structures at NAFB. In a letter dated 14 June 1991, the SHPO reviewed the evaluation and concurred with its recommendations. Although the McCarran Field Air Terminal Building was considered by NAFB CRM as eligible on the basis of local importance, a 1996 evaluation by the SHPO historian determined the alterations to the building had compromised its physical integrity. Thus, no structures were determined eligible.

In 1995, Mariah Associates, Inc., completed a preliminary evaluation, interpretation, and prioritization of Cold War facilities for 27 ACC bases throughout the U.S. NAFB's primary Cold War mission was to train Air Training Command and Tactical Air Command pilots. Buildings and collections recommended for additional research at that time included the Threat Facility, the Red Flag air combat training center, the Weapons School Facility, the Thunderbirds maintenance hangar, and the Command Center, and certain document collections (Lowe et al. 1994). No facilities were recommended for further review.

A Plan to overview NAFB and to provide processes to inventory and evaluate historic-aged and other buildings is in process and any structures that could be impacted would be evaluated prior to improvements under this EA.



In 2004, 336 Wherry houses constructed from 1950 to 1957 and 113 Capehart structures built on Nellis AFB in 1960 were proposed for demolition. Dobson-Brown (2004) conducted the field research and argued the buildings lacked physical integrity for further eligibility consideration. The SHPO concurred with the recommendation (Air Force 2010b). Following this review, Nellis AFB determined an updated historic building inventory for the Nellis AFB Las Vegas Valley properties was necessary.

According to 36 CFR 60.4 (g), special properties may have achieved significance within the last 50 years due to exceptional importance within appropriate local, state, or national historic contexts. Due to the Cold War's exceptional importance to our Nation's history, the Department of Defense Legacy Resource Management Program's Cold War Task Area was developed to accomplish evaluations of Cold War significance in response to a Congressional mandate. Congress established the Department of Defense Appropriations Act in 1991 in order to support the mandate which required the DoD "inventory, protect, and conserve" the heritage of the DoD during the Cold War. Additionally, an action memo sent to the Air Force Civil Engineer in 1992 recognized that delaying the preservation of historic resources until they reached 50 years of age would result in the loss of valuable resources. As a result, the memo stated the SHPO would be consulted prior to any actions with the potential to affect Cold War facilities in part to reduce the loss of these valuable resources which had not yet been evaluated as they had yet to reach 50 years of age.

Nine structures, constructed between 1951 and 1971, were inventoried in 2006 (Air Force 2006c). The buildings are part of the larger survey and evaluation of 172 buildings from the Cold War era on Nellis AFB that is in process; however due to their proposed demolition as part of the Base Realignment and Closure and Win Infrastructure Development Outlook actions occurring on the base, a separate report on eligibility recommendations for Nevada SHPO Section 106 review was requested by Nellis AFB. These facilities include seven buildings that are older than 50 years (Buildings 67, 250, 258, 265, 839, 841, and 941) and two buildings that are less than 50 years old (Buildings 264 and 413). Consultation with SHPO on the ineligibility of the nine structures was completed in December 2006. The Nevada SHPO concurred that the nine structures were not eligible for nomination to the NRHP.

### ***Traditional Cultural Properties***

Traditional cultural properties include archaeological resources, Native American sites, and sacred sites, among others. NEPA requires that Federal agencies consider the impacts of their actions on the human environment, which includes both the physical environment and the cultural environment. No Traditional Cultural Properties have been located on NAFB. NAFB consults with the XXX[LSC1] Tribal Historic Preservation Office.

## **3.6 BIOLOGICAL RESOURCES**

Biological resources encompass plant and animal species and the habitats within which they occur. Plant species are often referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to survive at that location (Hall *et al.* 1997). Biological resources for this EA include

vegetation, wetlands, wildlife, and special-status species occurring in the vicinity of the proposed projects on Nellis AFB.

### ***Vegetation***

Vegetation includes all existing upland terrestrial plant communities with the exception of wetlands or special-status species. The affected environment for vegetation includes those areas subject to demolition and construction ground disturbance.

### ***Wetlands and Jurisdictional Waters of the United States***

Wetlands are considered special category sensitive habitats and are subject to regulatory authority under Section 404 of the Clean Water Act and Executive Order 11990 *Protection of Wetlands*. They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the United States Army Corps of Engineers (USACE) and EPA as those areas that meet all the criteria defined in the USACE's 1987 *Wetlands Delineation Manual* and under the jurisdiction of the USACE (USACE 1987). Wetlands are generally associated with drainages, stream channels, and water discharge areas (natural and man-made). The discussion on wetlands pertains to the potential to affect wetlands and jurisdictional waters of the U.S. due to construction or demolition activities under the proposed action.

### ***Wildlife***

For the purposes of this EA wildlife includes all vertebrate animals (i.e., fish, amphibians, reptiles, birds, and mammals) with the exception of those identified as threatened, endangered, or sensitive species. Wildlife potentially affected by demolition and construction activities and construction noise will be discussed.

### ***Special-Status Species***

Special-status species are defined as those plant and animal species listed as threatened, endangered, or proposed as such by the United States Fish and Wildlife Service (USFWS). The federal Endangered Species Act (ESA) protects federally listed, threatened, and endangered plant and animal species. Species of concern are not protected by the ESA; however, these species could become listed and protected at any time. Their consideration early in the planning process could avoid future conflicts that might otherwise occur. The discussion of special-status species focuses on those species with the potential to be affected by demolition, construction, and construction-related noise.

## **Affected Environment**

The affected environment for biological resources includes areas of Nellis AFB potentially affected by ground-disturbing activities such as demolition, construction, or infrastructure development and noise. All baseline data were gathered from previous studies such as the *Integrated Natural Resource Management Plan for Nellis Air Force Base* (Air Force 2010b). Areas on Nellis AFB could experience development constraints. The presence of several special-status species in Areas II and III on Nellis AFB could pose constraints on future development.

The affected environment for biological resources includes areas of Nellis AFB potentially affected by ground-disturbing activities such as demolition, construction, or infrastructure development and noise.

## **Vegetation**

Nellis AFB is located in the Mojave Desert. Large expanses of the valley floors in the Mojave Desert support the creosote bush (*Larrea tridentata*)-white bursage (*Ambrosia dumosa*) desert scrub community.



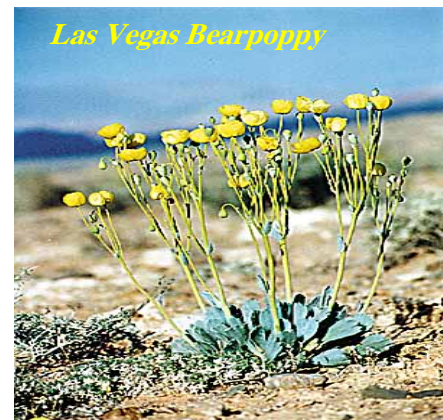
*Las Vegas Buckwheat*

The creosote bush and white bursage dominate plant communities at elevations from below sea level to about 3,940 feet (Hazlett *et al.* 1997). This desert scrub community, characteristic of much of the Mojave Desert can still be found in the less developed areas of Nellis AFB, such as the eastern portion of Area II. Tamarisk or salt cedar (*Tamarix* spp.) is an introduced, non-native perennial plant species that has had a notable effect on plant associations.

Nellis AFB has an aggressive

program to eradicate Tamarisk from the installation.

Traditionally, non-native drought-tolerant deciduous trees and shrubs, evergreen trees and shrubs, perennials, ground covers, vines, and grasses have also been planted throughout the base, however, over the past several years the focus has been on planting native vegetation. Introduced native and non-native vegetation are contained mostly within and adjacent to developed areas at the base (Air Force 2010b).



*Las Vegas Bearpoppy*

Las Vegas bearpoppy (*Arctomecon californica*) and Las Vegas buckwheat (*Eriogonum corymbosum*), both plant species of concern, are present on gypsiferous soils in three different locations on Nellis AFB. These two plant species are discussed in detail in the special-status species section under Nellis AFB.

## **Wetlands and Jurisdictional Waters of the United States**

The only waters on Nellis AFB that could be considered wetlands are the golf course ponds. However, USACE personnel have determined that these man-made water sources are not subject to wetlands protection under the provisions of the CWA because they are man-made and the water source is not natural (Air Force 2010b). Because the Las Vegas Wash is connected to the Colorado River, any ephemeral streams and washes eventually emptying into the Las Vegas Wash could be considered jurisdictional under Section 404 of the CWA. The Range Wash flows into a retention basin upstream of the Sloan Channel which eventually flows to the Las Vegas Wash (Air Force 2010b).

## **Wildlife**

Due to its location adjacent to metropolitan Las Vegas and previous development and construction activities, Nellis AFB is primarily an urban environment with some relatively undisturbed lands lying to

the east and north of the base. Wildlife species found on base are mostly limited to those that have adapted to high levels of human activity and disturbance. Three general habitat types are present on the base: urban areas, open space recreation (e.g., golf course), and native desertscrub vegetation. Common bird species in the urban areas include house finch and house sparrow. Open spaces are frequented by American coot (*Fulica americana*), horned lark (*Eremophila alpestris*), great-tailed grackle (*Quiscalus mexicanus*), and domestic geese and ducks. The areas with the most diverse wildlife are those containing native desertscrub vegetation. Area II (refer to Figure 1-2) comprises the most undisturbed native desertscrub habitat on the base. Coyote (*Canis latrans*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), desert spiny lizard (*Sceloporus magister*), and side-blotched lizard (*Uta stansburiana*) are common wildlife species found in the vicinity of the base (Air Force 2010b).

### **Special-Status Species**

Only one federally-listed animal species, the desert tortoise (*Gopherus agassizii*), is present on the base in low densities in undeveloped portions of Area II. The desert tortoise was listed by the USFWS as threatened on April 2, 1990. It is the largest reptile in the arid southwestern U.S. Tortoises spend much of their lives in underground burrows that they excavate to escape the harsh summer and winter desert conditions. They usually emerge in late



winter or early spring and again in the fall to feed and mate, although they may be active during summer when temperatures are moderate. Desert tortoises are herbivorous, eating a wide variety of herbaceous vegetation, especially flowers of annual plants. Historically the tortoise occupied a variety of desert communities in southeastern California, southern Nevada, western and southern Arizona, southwestern Utah, and through Sonora and northern Sinaloa, Mexico. Today it can still be found in these areas, although the populations are fragmented and declining over most of its former range (Air Force 2010b).

A USFWS Biological Opinion (USFWS 2007) regarding future impacts to the desert tortoise population states the level of impact was "...not likely to jeopardize the continued existence of the threatened Mojave population of the desert tortoise ...". The USFWS issued reasonable and prudent measures, including implementing terms and conditions designed to minimize incidental take in Areas I, II, and III. According to 50 CFR Section 402.16, any new Air Force action that may affect the desert tortoise in portions of Areas I and II, not considered in previous Biological Opinions, would require reinitiation of consultation with the USFWS. The opinion, however, noted that Area I contained no tortoises.

Two plant and two other animal Federal species of concern have been observed or occur on Nellis AFB. These are the Las Vegas bearpoppy, Las Vegas buckwheat, chuckwalla (*Sauromalus obesus*), and western burrowing owl (*Athene cunicularia*). Four populations of Las Vegas bearpoppy have been located on Nellis AFB: three small populations in Area II and one large population in Area III. A conservation area containing the largest Las Vegas Bearpoppy and Las Vegas Buckwheat populations on the base has been established in Area III (Air Force 2010b). The Gila monster, classified as protected by the state, could be found in Area II. Nellis AFB implements State of Nevada protocols if Gila monsters are encountered during construction and are provided in Appendix E.





The presence of chuckwalla on Nellis AFB has been confirmed due to observations of scat on the Sunrise Mountain foothills in the eastern portion of Area II. The chuckwallas inhabit rocky hillsides, talus slopes, and rock outcrops in areas dominated by creosote. Western burrowing owl is a species native to southern Nevada that adapts well to urban environments. The species prefer flat, previously

disturbed areas like those found around the southern boundary of Nellis AFB where loose soil allows for excavation of burrows. Prior to the initiation of any project construction, surveys coordinated through the Natural Resources Manager would be conducted to determine the presence of any special status plant and wildlife species.

### **3.7 WATER AND SOIL RESOURCES**

#### ***Water Resources***

Water resources include surface and ground water. Lakes, rivers, and streams comprise surface water resources that are important for economic, ecological, recreational, and human health reasons. Groundwater is used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. Attributes of water resources considered in this EA include hydrologic setting, availability, use, quality (including protection zones), floodplains, flood hazard, and adjudicated claims to water rights for both surface and groundwater. The CWA of 1972 is the primary federal law that protects the nation's waters, including lakes, rivers, and aquifers. Jurisdictional waters of the U.S. are regulated resources and are subject to federal authority under Section 404 of the CWA. This term is broadly defined to include navigable waters (including intermittent streams), impoundments, tributary streams, and wetlands.

Criteria for water quality within the State of Nevada are contained in the Nevada Administrative Code, Chapter 445A.119, and apply to existing and designated beneficial uses of surface water bodies. Water quality standards are driven by the beneficial uses of specific water bodies. Beneficial uses include agriculture (irrigation and livestock watering), aquatic life, recreation (contact and non-contact), municipal or domestic supply, industrial supply, and wildlife propagation.

The State of Nevada has adopted drinking water standards established by the EPA, under the Safe Drinking Water Act. The Nevada Department of Health regulates drinking water quality for public supply systems. Drinking water standards consist of maximum contaminant levels established for various water quality constituents to protect against adverse health effects.

#### ***Soil Resources***

Soil refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support structures and facilities. Relative to development, soils typically are described in terms of their

type, slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of land use.

## **Affected Environment**

### ***Water Resources***

The Sierra Nevada, stretching along Nevada's western border, interrupts the prevailing easterly flow of storm systems and the state's access to precipitation, resulting in a "rain shadow." Surface water is sparse in Nevada. Typically, as much as 75 percent of Nevada's precipitation falls during the winter. The Great Basin subprovince drains internally; precipitation has no surface water outlet to the Pacific Ocean. Average precipitation depends mainly on elevation and ranges from 4 inches on the desert floor to 16 inches in the mountain areas. With the exception of locally intense thunderstorms that can produce flash flooding, much of the warm weather precipitation is lost to the atmosphere through evaporation and transpiration. Flash floods produce high peak flows over short periods.

Nevada's groundwater is typically found in unconsolidated deposits of sand, gravel, silt, and clay that partly fill the many basins. Most groundwater development is in basins where water is readily obtained from shallow unconsolidated deposits where well yields are more predictable than in the mountains.

Nellis AFB lies in the southern portion of the Las Vegas Valley within the Colorado River Basin. Natural surface waters and perennial streams are nonexistent on base. A 100-year floodplain lies adjacent to the southeastern portion of the golf course; no 100-year floodplains occur within the developed portions of the base. The minimal precipitation that is captured on base is drawn into the valley's principal basin-fill aquifer, shallow aquifers, and the Colorado River.

Nellis AFB is underlain by carbonate rock aquifers of the Death Valley and Colorado aquifer systems (U.S. Geological Survey 1997), which are hydrologically connected to shallower alluvial aquifer systems composed of sand and gravels. The principal aquifer in the Las Vegas Valley hydrologic basin is naturally recharged by 9.8 to 11.4 billion gallons per year mostly from the Spring Mountains on the west valley boundary. Recharge of the shallow aquifers is also occurring, primarily as a result of irrigation water percolating into the ground.

A few ephemeral streams occur on Nellis AFB, particularly in Area II. No natural lakes or other open bodies of water, excluding manmade impoundments, are found on Nellis AFB. However, low precipitation, a lack of slope, and the paucity of ephemeral streams create a context where the potential for water erosion is rare. Seven man-made ponds are found within the boundary of Nellis AFB on the Sunrise Vista Golf Course.

Sources of groundwater are available from the principal alluvial-fill aquifer underlying the Las Vegas Valley. In addition to on-base wells, wells are located in both the northwest part of the valley for the Las Vegas Valley Water District/Southern Nevada Water Authority and in the northern end of the valley for North Las Vegas Water District. The current water supply at Nellis AFB is considered adequate (Air Force 2011b).

### ***Soil Resources***

Nellis AFB is located in the southern part of the Las Vegas Valley. The elevation of Nellis AFB is about 2,000 feet above sea level. The ground surface over most of Nellis AFB is disturbed by man-made features, such as airfields, roads, and buildings. Over most of the base, slopes are 1 percent or less.

Nellis AFB lies primarily on two types of soil, the Las Vegas-Destazo complex and the Las Vegas-Skyhaven complex (U.S. Department of Agriculture 1985). These soils are very similar physically and chemically. Las Vegas soils comprise 60 percent of Nellis AFB soils and Skyhaven and Destazo soils together comprise 25 to 30 percent, leaving 10 to 15 percent McCarran-Grapevine complex, Weiser-Goodsprings complex, and Glencarb silt loam. The main soil types share the following attributes:

- moderately slow permeability;
- slight potential for water erosion;
- high potential for wind erosion; and
- a shallow hardpan layer that limits construction.

These attributes indicate that ground disturbance at Nellis AFB, such as construction, could lead to a high degree of wind erosion. Erosion from precipitation and runoff is minimal, due to soil characteristics and lack of slope on Nellis AFB.

## **3.8 AIR QUALITY**

Air quality is defined by ambient air concentrations of specific pollutants determined by the EPA to be of concern related to the health and welfare of the general public and the environment. Widespread across the U.S., the primary pollutants of concern are called “criteria pollutants” and include carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), suspended particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM<sub>10</sub>), fine particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (PM<sub>2.5</sub>), and lead. Under the Clean Air Act (CAA), the EPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for these pollutants. These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects.

### ***Applicable Regulatory Requirements***

The NDEP, Bureau of Air Pollution Control has adopted the NAAQS, with the exception of an additional 8-hour CO standard specific to elevations greater than 5,000 feet above mean seal level and a 1-hour standard for hydrogen sulfide. The national and state ambient air quality standards are presented in Appendix B.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs) which are regulated under Section 112(b) of the 1990 CAA Amendments. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions

from stationary sources (40 CFR Part 61). HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs); these are compounds emitted from highway vehicles and non-road equipment (including aircraft engines) that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, EPA issued its first MSAT Rule, which identified 21 compounds as being HAPs that required regulation. In February 2007, EPA issued a second MSAT Rule which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented. The primary control methodologies for MSATs involve reducing their content in fuel and altering engine operating characteristics to reduce the volume of pollutants generated during combustion. MSATs would be the primary HAPs emitted by mobile sources during construction and operations. The equipment used during construction would likely vary in age and have a range of pollution reduction effectiveness. Construction equipment, however, would be operated intermittently over a large area and would produce negligible ambient HAPs in a localized area. Therefore MSAT emissions are not considered further in this analysis.

The CAA requires each state to develop a State Implementation Plan (SIP) which is its primary mechanism for ensuring that the NAAQS are achieved and/or maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. The CAA provides that federal actions in nonattainment and maintenance areas do not hinder future attainment with the NAAQS and conform to the applicable SIP. All federal actions must also comply with state and local regulations.

### ***Greenhouse Gases (GHGs)***

GHGs are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative environmental, economic, and social consequences across the globe.

Individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions combine with other GHG emissions from other man-made activities on a global scale.

### **Affected Environment**

The area of potential affect for the air quality analysis includes the Las Vegas Intrastate Air Quality Control Region, which is comprised of Clark County. Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO<sub>2</sub>, lead, and some particulates, are emitted



directly into the atmosphere from emission sources. Secondary pollutants, such as O<sub>3</sub>, NO<sub>2</sub>, and some particulates are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. Airborne emissions of lead are not addressed in this EA because there are no significant lead emission sources associated with the proposed action.

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as non-attainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. Clark County, which includes Nellis AFB is in attainment or unclassifiable for PM<sub>2.5</sub>, SO<sub>2</sub>, Lead, and NO<sub>2</sub>. Part of the County (including Nellis AFB) is designated nonattainment for 8-hour ozone and PM<sub>10</sub> and is a maintenance area for CO (40 CFR 81.329). Because the Air Quality Control Region is nonattainment PM<sub>10</sub> and a maintenance area for CO and ozone, the Clean Air Act General Conformity Rule (40 CFR Parts 51 and 93) applies and is addressed in the impact analysis.

The EPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year) vary from pollutant to pollutant established by the air pollution control district through the New Source Review regulations, approved by EPA, and also depend on the severity of the nonattainment status.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result from a federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which may occur at a later time and/or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emission thresholds of the proposed action, then the conformity evaluation process is completed.

Ground-based air emissions at Nellis AFB are primarily generated from maintenance shops, aerospace ground equipment (AGE), boilers, and paint booths. Emissions associated with airfield operations (landing, takeoff, touch-and-go) are calculated based on aircraft emissions calculated as part of the 1999 F-22 Beddown EIS (Air Force 1999) as well as the proposed activity summaries generated in support of the 2011 F-35 FDE and Weapon School Beddown EIS (Air Force 2011a). These documents provide the information regarding specific emission totals for construction for the beddown proposed action, commuters and aircraft operations for the year 2012 in Table 4.4-2 of the F-35 EIS were used. Ground-based data are from the Nellis AFB 2011 stationary source emission inventory. Clark County emission data are from the latest EPA National Emission Inventory, which is for the year 2010. The combination of

the baseline aircraft operations from 1999, the 2012 emissions from the proposed F-35 beddown, and stationary source emissions as reflected in the installation emission inventory are combined and quantify baseline conditions for this EA (Table 3-2).

| <b>Table 3-2. Summary of Baseline Emissions at Nellis AFB (tons/year)</b> |              |               |                       |                       |                        |                         |
|---|--------------|---------------|-----------------------|-----------------------|------------------------|-------------------------|
| <i>Source</i>   | <i>CO</i>    | <i>VOCs</i>   | <i>NO<sub>x</sub></i> | <i>SO<sub>x</sub></i> | <i>PM<sub>10</sub></i> | <i>PM<sub>2.5</sub></i> |
| Ground-Based  | 22.19        | 16.52         | 46.03                 | 1.12                  | 16.72                  | 16.08                   |
| Aircraft, Construction, Commuters   | 959.94       | 320.85        | 470.56                | 346.39                | 33.59                  | 32.79                   |
| <b>Total</b>  | <b>82.13</b> | <b>337.37</b> | <b>516.59</b>         | <b>347.51</b>         | <b>50.31</b>           | <b>48.87</b>            |
| Clark County <sup>1</sup>   | 264,408      | 169,725       | 47,822                | 6,725                 | 132,741                | 17,977                  |
| Nellis AFB Percent Contribution   | 0.37         | 0.20          | 1.08                  | 5.17                  | 0.04                   | 0.27                    |

Sources: Ground-based emissions, Air Emissions Inventory for 2011 at Nellis AFB (Air Force 2012b);

Aircraft emissions (Air Force 1999)

Notes: <sup>1</sup>Clark County 2010 Emissions (EPA 2012).

The total annual CO emissions at Nellis AFB represent about 0.4 percent of the 2011 CO emissions for Clark County. PM<sub>10</sub> emissions for Nellis AFB account for about 0.04 percent of the Clark County 2011 total. Volatile Organic Compounds (VOCs) and NO<sub>x</sub> (nitrogen oxide ozone precursors) at Nellis AFB represent less than 1 percent and approximately 1 percent, respectively of the total Clark County emissions. None of these pollutants represents a substantive contributor to nonattainment for the Las Vegas Valley area.

### 3.9 HAZARDOUS MATERIALS AND WASTE

Hazardous materials (HAZMAT), listed under the Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), and the Emergency Planning and Community Right-to-Know Act, are defined as any substance that, due to quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Examples of HAZMAT include petroleum products, synthetic gas, and toxic chemicals. Hazardous wastes, listed under the Resource Conservation and Recovery Act (RCRA), are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment. Additionally, hazardous wastes must either meet a hazardous characteristic of ignitability, corrosivity, or reactivity under 40 CFR Part 261, or be listed as a waste under 40 CFR Part 263.

Hazardous materials and wastes are federally regulated by the EPA, in accordance with the Federal Water Pollution Control Act; CWA; Toxic Substance Control Act; RCRA; CERCLA; and CAA. The federal government is required to comply with these acts and all applicable state regulations under Executive Order 12088 and DoD Directive 4150.7, Air Force Instruction 32-1053. Additionally, Executive Order 12088, under the authority of the EPA, ensures that necessary actions are taken for the prevention, management, and abatement of environmental pollution from HAZMAT or hazardous waste due to federal activities. Other topics commonly addressed under hazardous materials and waste includes underground storage tanks and potential contaminated sites designated under the Air Force's ERP.

Asbestos-containing material (ACM) is any material containing more than 1 percent by weight of asbestos and can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure. Asbestos is

made up of microscopic bundles of fibers that may be airborne when distributed or damaged. Due to its availability to withstand heat, fire, and chemicals, asbestos was historically used in construction materials, and is typically found in ceiling tiles, pipe and vessel insulation, floor tile, linoleum, mastic, and on structural beams and ceilings. Laws which address the health risks of exposure to asbestos and ACMs include Toxic Substance Control Act, Occupational Health and Safety Administration regulations (29 CFR), and CAA (Section 112 of the CAA, as amended, 42 USC § 7401 *et seq.*). EPA regulations concerning asbestos are contained in 40 CFR 61. The regulations require that the EPA or authorized state agencies be notified of asbestos removal projects.

Lead-based paint (LBP) was commonly used from the 1940s until the 1970s for exterior and interior painted surfaces. In 1978, the U.S. Consumer Product Safety Commission lowered the legal maximum lead content in most kinds of paint to trace amounts, therefore, buildings constructed after 1978 are presumed not to contain LBP. The use and management of LBP is regulated under Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992. Section 1017 requires the implementation of federally supported work involving risk assessments, inspection, interim controls, and abatement of lead-based paint hazards. Regulations relating to LBP can be found at 29 CFR, 40 CFR, and 49 CFR.

### **Affected Environment**

This discussion of HAZMAT and waste includes the sites and facilities at Nellis AFB where hazardous materials are used, stored, or disposed. The affected areas for potential impacts related to HAZMAT and waste consists of Nellis AFB with an emphasis on aircraft maintenance and munitions handling areas. Potential hazardous waste contamination areas that are under investigation as part of the Air Force ERP are also discussed. Constraints to development could occur when proposed projects are sited on or near ERP sites.

### ***Hazardous Materials and Hazardous Waste Generation***

Activities at Nellis AFB require the use and storage of a variety of hazardous materials that include flammable and combustible liquids, acids, corrosives, caustics, anti-icing chemicals, compressed gases, solvents, paints, paint thinners, and pesticides. The Nellis AFB Hazardous Waste Management Plan (Air Force 2010c) provides guidance and procedures for proper management of RCRA and non-RCRA hazardous waste generated on the base to ensure compliance with applicable regulations. To manage these materials, Nellis AFB uses a hazardous material pharmacy (HAZMART) pollution prevention system. This process provides centralized management of the procurement, handling, storage, and issuing of hazardous materials, as well as the turn-in, recovery, reuse, recycling, and disposal of hazardous wastes. The HAZMART approval process also includes review and approval by Air Force personnel. In addition, the base has a Facilities Response Plan, (Air Force 2002), which includes site specific contingency plans.

Nellis AFB is considered a large quantity generator by the EPA. Hazardous waste at Nellis AFB is accumulated at an approved 90-day storage area on the base, or at Initial Accumulation Points (IAP). One 90-day Central Accumulation Point storage area is operated at Nellis AFB as a collection area for wastes received from the IAPs. Each accumulation point must comply with requirements for siting, physical construction, operation, marking, labeling, and inspection and must maintain a container inspection log. Generators of hazardous wastes are responsible for properly segregating, storing,

characterizing, labeling, marking, and packaging all hazardous waste for disposal as mandated in the Hazardous Materials Table in 49 CFR Part 172.101.

A variety of activities on base, including aircraft maintenance and support, civil engineering, and printing operations, have been identified as primary contributors to hazardous waste streams. Numerous other shops add to hazardous waste streams, including AGE, Aircraft Structural Maintenance, Fuels Management, Non-Destructive Inspection, Munitions and Armament Shops, In-Squadron Maintenance, and the Wheel and Tire Shop. Routine activities conducted on the flight line generate paints containing lead-mercury-chromium, hazardous waste containers, and contaminated rags. Wastes derived from maintenance activities include petroleum, oils, and lubricants, paints and paint-related wastes such as thinners and strippers, batteries, contaminated spill absorbent, adhesives, sealers, solvents, fuel filters, photochemicals, ignitable wastes, and metals. Basic processes and waste handling procedures for general aircraft maintenance activities are identified in the Nellis AFB Hazardous Waste Management Plan (Air Force 2010c). Nellis continues to reduce the waste generated. The reduction of hazardous waste has saved the base more than 180,000 dollars in disposal cost in 2010, compared to the hazardous waste generated in 1992 (Air Force 2011c).

Nellis AFB has a proactive program to identify asbestos and lead in all structures in order to reduce potential hazards to occupant, workers, and the environment during construction projects. Many buildings on base date from the 1940s through the 1980s; asbestos-containing materials have been identified in many of these facilities. Renovation or demolition of on-base structures is reviewed by Civil Engineering personnel to ensure appropriate measures are taken to reduce potential exposure to, and release of, friable asbestos. Non-friable asbestos is not considered a hazardous material until it is removed or disturbed. The Nellis AFB Asbestos Management and Operations Plan (Air Force 2003b) and Nellis AFB Lead-Based Paint Management Plan (Air Force 2003c) provides guidance on the proper handling and disposal of ACM and lead-based paint.

#### ***Environmental Restoration Program Sites***

ERP sites are those sites where contamination occurred prior to 1985 and thus, remediation efforts are directed by CERCLA. Remediation measures require containment and could include contaminant removal and disposal. ERP sites on Nellis AFB include abandoned landfills, underground contaminant plumes, and ordnance disposal pits. There are currently nine ERP sites in active remediation on the base (Air Force 2004).

An ERP waiver would be required if proposed construction should occur above ERP groundwater plumes. If proposed construction should occur on an ERP site, the remediation would need to be completed prior to initiation of the project.

### **3.10 SAFETY**

Safety for this EA addresses ground, flight, and munitions safety. Ground safety considers issues associated with operations and maintenance activities. Flight safety assesses issues associated with flight line and airfield operations affecting aircraft and aircrew safety. Munitions safety assesses the management and use of ordnance or munitions associated with air base operations.

Operations and maintenance activities are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health requirements. In addition, UFC 3-260-01, *Airfield and Heliport Planning and Design Criteria*, limits locations and heights of objects and facilities around and in the immediate vicinity of an airfield to minimize hazards to airfield and flight operations. Any condition not meeting these requirements is classified as an approved waiver, a permissible deviation, an exemption, or a violation (UFC 3-260-01). Quantity-distance criteria specified in DoD

6055.9-STD, *DoD Ammunition and Explosives Safety Standards* and Air Force Manual 91-201, *Explosive Safety Standards*. The standards include implementation of safe distances between non-explosive related facilities and personnel from weapons-loaded aircraft. Antiterrorism/Force protection measures are required in facility siting and construction to reduce the vulnerability of personnel and property.

Munitions are handled and stored in accordance with Air Force Manual 91-201, *Explosive Safety Standards*, and all munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data.

## **Affected Environment**

### ***Ground Safety***

The Nellis AFB military fire department provides fire and crash response. The base maintains detailed mishap response procedures to respond to a wide range of potential incidents. These processes assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off base. Initial response to a mishap considers such factors as rescue, evacuation, fire suppression, safety, and elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. After all required actions on the site are complete, the base civil engineer ensures cleanup of the site.

### ***Flight Safety***

Flight safety includes aircraft flight risks such as aircraft accidents, and Bird/Wildlife-Aircraft Strike Hazard. Nellis personnel responsible for flight safety review projects for airfield safety criteria such as obstructions and height limits and advise on actions regarding how the project is likely to impact the potential for increased risk of flight mishaps including bird and wildlife strikes.

### ***Munitions Safety***

Personnel at Nellis AFB control, maintain, and store all ordnance and munitions required for mission performance. This includes training and inert bombs and rockets, live bombs and rockets, chaff, flares, gun ammunition, small arms ammunition, and other explosive and pyrotechnic devices. If a malfunction prevents release of ordnance during a mission, and the pilot must return to the base with “hung” ordnance, the aircraft is parked in revetments in the hung ordnance area while the ordnance (i.e., any ordnance of which an attempt to release, jettison, launch, or fire from an aircraft did not actuate as designed) is rendered safe. Sufficient storage facilities exist for current types and amounts of ordnance, and all facilities are approved for the ordnance they store.

### **3.11 NOISE**

*Noise* is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Response to noise varies by the type and characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day. Noise may be intermittent or continuous, steady or impulsive, and may be generated by stationary or mobile sources.

The time of day when a sound is emitted is an important factor in its annoyance potential. Sounds that may be barely noticeable at midday may be seriously disruptive at midnight. A number of measurement scales that attempt to account for this time factor have been developed. One of the more commonly used and accepted metrics of this type is the Day-Night Average A-Weighted Sound Level (DNL). DNL represents a 24-hour average sound level in which a 10-decibel (dB) penalty is added to any sounds occurring between the hours of 10:00 p.m. and 7:00 a.m. DNL has been widely accepted as the best metric to determine community reaction to noise.

#### **Affected Environment**

Local agencies, including cities and counties, are responsible for defining and enforcing land use compatibility in various noise environments. The AICUZ study is the Air Force's vehicle for presenting the noise environment at Nellis AFB.

The AICUZ program promotes compatible land development in areas subject to aircraft noise and accident potential. Clark County has incorporated these AICUZ recommendations as an integral part of their comprehensive planning process and are regulated in the Clark County Unified Development Code, Title 30, Section 30.48, Part A, Airport Environs Overlay District, dated June 21, 2000, under the authority of Chapter 278, Planning and Zoning, of the Nevada Revised Statutes. Noise compatibility and airport environs implementing standards have also been adopted in the Clark County "Public Health and Safety Programs: Airport Environs Plan," an amendment of the Clark County Comprehensive Plan (Clark County 1998).

Modeling for the AICUZ study noise contours were developed using the following data: aircraft types, runway utilization patterns, engine power settings, altitude profiles, flight track locations, airspeed, number of operations per flight track, engine maintenance, and time of day. These studies were based on a representative day which evaluated airfield activity during a 24-hour period when the airfield is in full operation. The advantage of this approach is that it is unaffected by daily, monthly, and yearly fluctuations in the tempo (rate) of use by individual aircraft at the base. The AICUZ study employed the same fundamental computer-aided modeling approach using the NOISEMAP model. The latest published AICUZ study was conducted in 2003, however, there currently is a update top the AICUZ to reflect the F-35 noise contours but the AICUZ is still in draft status and has not yet been issued.

The affected environment for Nellis AFB is the base and adjacent commercial and residential areas affected by noise contours generated at the base. Sound levels from flight operations at Nellis AFB exceeding ambient background noise typically occur only beneath main approach and departure corridors and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from the

ambient background. The height at which the noise becomes indistinguishable varies depending on the aircraft and meteorological conditions.

Since the AICUZ report has not yet been completed reflecting F-35 noise contours, the F-35 FDE and WS Beddown Final EIS is used to identify baseline noise levels ranging from 65 DNL to greater than 85 DNL for the lands encompassing Nellis AFB (Figure 3-1). All lands affected by greater than 85 DNL occur within Nellis AFB, with most of the area affected by 75 to 85 DNL also on base. Lower noise levels (65 to 75 DNL) affect lands primarily outside the base. For off-base areas, noise levels range from 65 DNL to greater than 80 DNL (Air Force 2011a). Total acreage of areas affected by the noise levels is shown in Table 3-3.

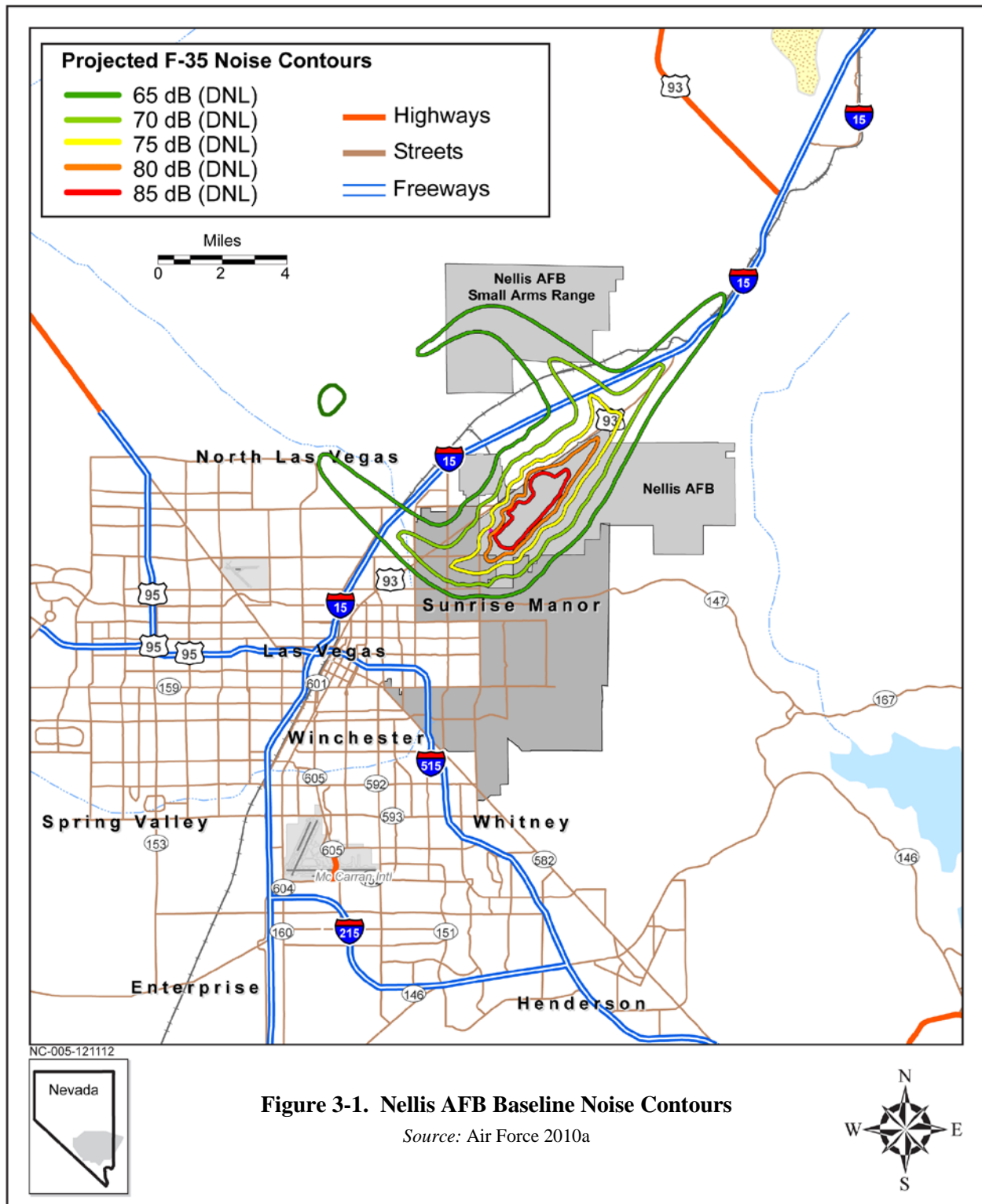
| <b>Table 3-3. Noise (DNL) Contours for Nellis AFB and Environs</b> |              |              |              |              |               |              |
|--|--------------|--------------|--------------|--------------|---------------|--------------|
|  | <b>65-70</b> | <b>70-75</b> | <b>75-80</b> | <b>80-85</b> | <b>&gt;85</b> | <b>Total</b> |
| Acres  | 13,991       | 6,259        | 2,804        | 1,268        | 1,338         | 25,660       |

*Note :* Includes proposed F-35A aircraft noise.  
*Source:* Air Force 2011a

Current noise levels of 65 DNL to greater than 85 DNL affect approximately 25,660 acres at Nellis AFB, with the highest noise levels on and around the runway and flight line. Nellis AFB currently has a program to reduce noise over off-base residential areas. Existing noise abatement procedures for flights over residential areas to the south and southwest and North Las Vegas include the following:

- expedited climb to 2,500 to 3,500 feet mean sea level (MSL) for all aircraft;
- 60-degree banked right turn upon departure to avoid populated areas;
- no unrestricted afterburner climbs on weekends or holidays, or before 10 a.m. daily, limited exceptions (functional check flights, incentive flights, operational missions, and syllabus requirements.)
- a departure to the north between 10 p.m. and 8 a.m.; and
- practice approaches only after 9:00 a.m. daily.

To the maximum extent possible, engine run-up locations have been established in areas that minimize noise for those in the surrounding communities, as well as for people on base. Normal base operations do not include late-night engine run-ups, but heavy workloads or unforeseen contingencies sometimes require a limited number of nighttime engine run-ups.





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## **CHAPTER 4**

# **ENVIRONMENTAL CONSEQUENCES**

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## **4.0 ENVIRONMENTAL CONSEQUENCES**

### **4.1 ANALYSIS APPROACH**

The approach used for this environmental impact analysis is to assess and compare potential impacts to environmental resources with implementation of the proposed action or the no-action alternative at Nellis AFB. Alternatives to the proposed action are discussed in Chapter 2 and vary from the proposed action in terms of placement of facilities within an area; therefore, the impacts associated with the alternatives would be approximately the same as the proposed action and need not be discussed further in this EA. The direct and indirect effects are identified, and where appropriate, the implementation of best management practices to minimize potential environmental impacts along with any additional practical mitigation to minimize impacts is identified. Short- and long-term impacts are identified, where possible. In general, one long-term beneficial impact from implementation of the proposed action projects would be energy conservation for Nellis AFB. Potential impacts are quantified wherever possible and discussed at a level of detail necessary to determine the significance of the impacts. Cumulative effects of the proposed action and alternatives when considering past, present, and foreseeable future actions are presented in Chapter 5.

#### **4.1.1 Environmental Effects**

This portion of the analysis considers the potential environmental impact to resources from implementation of proposed construction and renovation projects. Just as cumulative effects in Chapter 5 (see Section 5.1) consider potential environmental impacts resulting from “the incremental impacts of an action when added to other past, present, and reasonable foreseeable future actions...” this analysis will evaluate the potential effects to individual resources due to the projects occurring in the same relative vicinity.

### **4.2 LAND USE AND TRANSPORTATION**

This section focuses on the impacts to land use from implementation of the proposed action. The threshold level of significance for land use is the potential for the proposed action to change the land use in such a manner as to cause incompatibility with adjacent land management and/or uses. Criteria for determining significance for transportation resources are whether the proposed action would create enough additional traffic such that the roads cannot meet the demands of the total traffic.

#### **4.2.1 Nellis AFB**

The overall future land use by categories is listed in Table 4-1 which depicts the land uses in the more traditional terms (i.e. airfield, community commercial, open space etc.). No change to land use is anticipated due to implementation of the CIP project since one of the criteria for projects is to locate projects within compatible use areas.

| <b>Table 4-1. Land Use at Nellis AFB</b> |                |                   |
|--|----------------|-------------------|
| <b>Land Use Category</b>                 | <b>Acreage</b> | <b>% of Total</b> |
| Airfield and Airfield Pavements          | 1,517          | 10                |
| Aircraft Operations and Maintenance      | 587            | 4                 |
| Industrial                               | 6,115          | 39                |
| Administrative                           | 298            | 2                 |
| Community Commercial                     | 91             | <1                |
| Community Service                        | 151            | 1                 |
| Medical                                  | 46             | <1                |
| Housing (Accompanied)                    | 406            | 3                 |
| Housing (Unaccompanied)                  | 64             | <1                |
| Outdoor Recreation                       | 642            | 4                 |
| Open Space                               | 5,618          | 36                |
| Water                                    | 5              | <1                |
| <b>Total</b>                             | <b>15,540</b>  | <b>100</b>        |

### **Base Roads**

Data during the 2006 Nellis AFB Traffic Study indicates vehicular occupancy is approximately 1.08 people per vehicle on base. In 2006, the study indicated about 7,000 employed persons (i.e., active duty military and civilians) lived off base resulting in about 6,481 daily vehicle trips in the vicinity of and at Nellis AFB (Air Force 2006d). Due to mission growth including BRAC actions, F-35A and other activities, the study estimated an additional 2,200 daily vehicles on the base resulting in approximately 8,700 daily vehicle trips.

Traffic levels on the base would be moderate to high during construction period if numerous projects were implemented in the same relative timeframe. Overall, the roadways leading to and on the installation would be able to accommodate the anticipated level of traffic associated with construction equipment and employees; however, the increased levels may create congestion on these roadways during peak traffic periods. Minor short-term off installation traffic impacts would be for projects involving construction and repair near the Main Gate, North Gate (Beale Ave), and the Tyndall Gate (Nellis Blvd) and to a lesser extent near the Area II Gate. Long-term beneficial transportation impacts include road and gate reconfigurations which would create more direct routing and reduce stop-sign bottlenecks. Other improvements include establishment of walking trails throughout popular pedestrian portions of the base and allow more direct routing for remaining.

One of the CIP projects most likely to impact traffic would be the implementation of a project to construct a round-about intersection inside the base immediately adjacent to the North Gate. Construction is anticipated to last for four months and traffic will likely be routed through the other gates. Intersections at the other entry gates; the Main Gate at Craig Road and Las Vegas Boulevard, and the Tyndall Gate at Nellis Boulevard and Tyndall Avenue, would increase by about 460 vehicles daily (Air Force 2006d). Distribution of the 460 vehicles would likely be towards the Main Gate initially but gradually even out to the Tyndall Gate as commutes get used to the traffic patterns. According to Nevada Department of Transportation statistics, the number of average annual daily traffic counts has decreased by several thousand from a peak of 17,000 AADT in 2005 to 13,000 AADT in 2011 on Las Vegas Boulevard at the Main Gate. Similarly, Craig Road had a maximum of 30,000 AADT in 2004 to 22,000 AADT in 2011 (Nevada Department of Transportation 2011). Peak traffic during commute hours will be increased

during the period when the North Gate is closed, but overall the traffic would be less than the peak periods during the mid-2000s.

#### **4.2.2 No-Action Alternative**

Under the no-action alternative, Nellis AFB would not implement CIP projects but as projects are implemented, each would undergo an individual analysis. Existing conditions to land use and transportation resources would remain unchanged under the no-action alternative.

### **4.3 INFRASTRUCTURE**

#### **4.3.1 Nellis AFB**

Energy Conservation Improvement Program (ECIP) projects are designed to improve energy and water efficiency in existing DoD facilities to reduce utility costs and decrease energy and water consumption. . Many of the projects for this Capital Improvements Program EA have ECIP designs embedded within the project (see Table 2-2). The benefits of the ECIP projects are greater than its costs, and the program has the potential to provide cost-effective energy conservation in the future. As such, and to the extent possible, each construction or repair project at Nellis AFB has ECIP principles as a stated objective and a number of them are specifically identified within the Infrastructure section. Impacts to infrastructure would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

#### **Water Systems**

Demand for potable water is not expected to dramatically increase during or after implementation of the proposed action as no increase in personnel would be expected to occur. The demand for potable water would continue to increase as population of Nellis AFB grows; however, the current supply is more than adequate to meet future demands. Current potable water usage averages 3.95 million gpd. In order to reach or exceed the current allotment of 7.1 million gpd, the population of Nellis AFB would have to double in size.

#### **Wastewater Systems**

There are no known impediments to wastewater treatment capacity in the near or distant future. The Southern Nevada Water Authority has proposed construction of and improvements to regional wastewater facilities in future years to accommodate projected regional population growth (Southern Nevada Water Authority 2004). An increase in wastewater flows would occur as a result of the increase in facility space. No adverse or significant impacts to wastewater treatment would be anticipated under the proposed action at Nellis AFB. Beneficial impacts from repair to sewer pumping stations and sewer lines would occur with planned projects.

#### **Electrical Systems**

An increase in electrical use would be anticipated as a result of the overall increase in facility space. However, a solar photovoltaic array is under construction on Nellis AFB, which offsets peak demand and will decrease energy consumption. New facility construction would employ energy-conserving equipment to reduce the impact on the existing electrical infrastructure. The current electrical system capacity would be adequate to meet the new requirements. Projects planned to conserve electrical energy

include installation of compact fluorescent bulbs throughout dormitories and lodging, programmable thermostats for heating, ventilation, and air conditioning, and day-lighting and upgraded controls in four hangars. Nearly every proposed project would enhance energy conservation at the base by installing the newest, most energy efficient appliance or apparatus relative to the action.

### **Stand-by Power**

Nellis AFB has recently replaced many back-up generator systems throughout the base with generators meeting Tier 2 standards. This has resulted in a more reliable back-up power configuration with lowered emissions. Mission-critical facilities are supported by 43 fixed Real Property Installed Equipment generator systems. An additional 17 mobile Equipment Authorization Inventory Data generators are available for contingency or emergency operations. New facilities projects, such as those anticipated in the proposed action, would continue, where required, to be provided with back-up power systems meeting Tier 2 standards.

### **Natural Gas Distribution**

The Southwest Gas Corporation has experienced no problems in meeting demands in southern Nevada and as such has not publicly placed limitations on future development. In fact, customer demand for natural gas has been declining in the region in the past several years (Nevada State Office of Energy 2005). No adverse or significant impacts to natural gas would be anticipated under the proposed action at Nellis AFB.

### **Storm Drainage**

The implementation of the proposed action would create additional impervious surfaces covered by buildings and paving, increasing storm water runoff; however, this increase is not considered significant or adverse. Drainage from these surfaces would be controlled using grading, curbs, drains, gutters, and other standard construction and post-construction storm water controls designed to prevent offsite impacts from storm water runoff. Proposed action projects at Nellis AFB would entail the extension, replacement, or addition of storm water drainage infrastructure through digging of trenches, either from existing lines along the nearest road or other primary locations. Trenches could also run from new buildings, roads, and aircraft parking ramps to discharge points in existing systems or additional locations in local drainage systems. Sustainable design measures would be incorporated into these systems and retention and detention structures would be implemented to minimize impacts from uncontrolled storm water discharges. Any facilities constructed for industrial operations, such as aircraft maintenance, would be designed to meet spill prevention, control, and countermeasures requirements under applicable state and Federal requirements. Such measures for utility systems would reduce the potential for adverse impacts from the storm water system. Numerous planned drainage repair projects would result in beneficial environmental impacts from the proposed action.

### **Heating, Ventilation, and Air Conditioning**

Nellis AFB has no central heating plant, with the exception of the base hospital complex. All base facilities are equipped with individual heating and cooling systems. However, Nellis AFB is actively researching the feasibility of more energy efficient systems, such as Gas Engine Driven Air Conditioning.

## **Fuel Systems**

Nellis AFB stores and pumps JP-8 jet fuel provided via pipeline from the CalNev Pipe Line Company for aircraft operations. To augment the east side flightline storage capacity, the base is planning to install a 10,000 barrel operating tank to relieve the just-in-time resupply rate of fuel from bulk storage to the east side. The proposed action projects would be beneficial to liquid fuels distribution at the base. Fuels projects associated with the proposed action include several projects to construct secondary containment; several repair projects to bring systems up to Unified Facilities Codes, replacement of underground storage tanks with above ground storage tanks, and installation of one tank for E-85 alternative fuel. All of these projects would provide beneficial impacts by reducing the risk of spillage or by providing means for supplying cleaner burning fuels.

## **Airfield Pavements**

Proposed action projects would include increases in aircraft parking ramp space at Nellis AFB. This would also increase the amount of impervious surfaces at the base. This increase would not be considered adverse or significant due to construction and post-construction storm water controls. See storm drainage section above.

## **Airfield Lighting**

Proposed action projects do not include increases in runway or taxiways at Nellis AFB and no increase in airfield lighting is anticipated.

## **Fire Protection Systems**

Proposed new buildings would include fire suppression systems and life safety requirements according to code. Numerous older hangars and facilities, however, still require funding to upgrade the rating to “adequate.”

## **Roofing Systems**

The “degraded” rating for roofing systems has been fully funded and should correct all deficiencies over the next 4 years.

## **Corrosion Control Systems**

Proposed new water tanks and natural gas piping risers would include cathodic protection systems and corrosion control systems as required. Numerous old issues, however, still require funding to upgrade the rating to “adequate.” No corrosion control upgrades have been proposed for funding at this time.

### **4.3.2 No-Action Alternative**

Under the no-action alternative, infrastructure improvements would rely on repairing infrastructure as problems arise on a reactionary basis vice a proactive basis. Fuels projects would not occur and the potential for spillage and an enhanced delivery system for E-85 diesel fuels would not occur.



#### **4.4 SOCIOECONOMICS**

Socioeconomic resources are defined as the basic attributes associated with the human environment, particularly population and economic activity. Population is described by the change in magnitude, characteristics, and distribution of people. Economic activity is typically composed of employment distribution, personal income, and business growth. Socioeconomics for this EA focus on the general features of the local economy that could be affected by the proposed action.

##### **4.4.1 Nellis AFB**

Construction activity on Nellis AFB under the proposed action is unknown with respect to how many of the CIP projects would be implemented and depends upon budgeting and funding, but even under low to medium funding levels there could be added expenditures of millions of dollars spanning the next few years. Construction activity would contribute to the local economy although the potential effects would be temporary. Impacts to socioeconomics would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

##### **4.4.2 No-Action Alternative**

CIP projects would not occur under the no-action alternative. Some construction, demolition, or renovation would still occur using the old CIP; therefore, socioeconomic impacts resulting from the no-action alternative would only be slightly increased from current conditions.

#### **4.5 CULTURAL RESOURCES**

Procedures for assessing adverse effects to cultural resources are discussed in regulations for 36 CFR Part 800 of the NHPA. An action results in adverse effects to a cultural resource eligible to the National Register when it alters the resource characteristics that qualify it for inclusion in the register. Adverse effects are most often a result of physical destruction, damage, or alteration of a resource; alteration of the character of the surrounding environment that contributes to the resource's eligibility; introduction of visual, audible, or atmospheric intrusions out of character with the resource or its setting; and neglect of the resource resulting in its deterioration or destruction; or transfer, lease, or sale of the property. In the case of the proposed action, potential effects to cultural resources could result from ground disturbing activities associated with construction or demolition of significant structures.

##### **4.5.1 Nellis AFB**

Under the proposed action, numerous buildings, parking lots, and concrete pads would be constructed, and roads built and rerouted over the period of the next 5 to 10 years. Some buildings would also be demolished during this time to make room for the improved facilities.

Proposals for federal actions are reviewed following 36 CFR 800 guidelines by the Nellis AFB Cultural Resources Manager. Areas of Potential Effect that have not been inspected will be field surveyed by qualified archaeologists. Native Americans will be invited to participate in the process. Actions in areas not previously reviewed through consultation, regardless of the need for field inventory or the ability to ensure avoidance of eligible properties will be subjected to consultation with Native Americans, THPOs

and SHPO to ensure no adverse effects to cultural resources occur due to the proposed actions. Since each project would be assessed individually, impacts to cultural resources would be independent of either Scenario 1, light construction, or Scenario 2, heavy construction.

#### **4.5.2 No-Action Alternative**

Under the no-action alternative, CIP projects would not occur, however some construction or renovations projects would still occur. Therefore, impacts to cultural resources would require individual analyses on a project-by-project basis to ensure there would be no impact to National Register-eligible or listed resources.

### **4.6 BIOLOGICAL RESOURCES**

Impacts to biological resources would be considered significant if one or more of the following conditions would result:

- Substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations by the Nevada Department of Wildlife or the USFWS;
- Substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations by Nevada Department of Wildlife or USFWS;
- Substantial adverse effect on federally-protected wetlands as defined by Section 404 of the CWA;
- Interfere substantially with the movement of native resident or migratory fish or wildlife species, wildlife corridors, or wildlife nursery sites;
- Conflict with local policies or ordinances protecting biological resources; or
- Conflict with the provisions or an approved local, regional, or state habitat conservation plan.

The definition of “substantial” is dependent on the species and habitats in question and the regional context in which the impact would occur as determined through consultation with USFWS, and the appropriate State and local Natural Resources management agencies. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available habitat in the region. These issues are discussed below with regard to their potential significance. Prior to the initiation of any project construction, surveys would be conducted to determine the presence of burrowing owls or special status plant and wildlife species, coordinated through the Nellis AFB Natural Resources Manager.

#### **4.6.1 Nellis AFB**

No adverse impacts to vegetation or wildlife would be expected since the construction and demolition projects would occur in previously developed areas of the base. Potential impacts to wildlife from construction noise would be short-term and not be expected to affect wildlife on the base that are already exposed to aircraft flight activities. No adverse impacts to rare plants species would be expected. Populations of Las Vegas bearpoppy and Las Vegas buckwheat located in Areas II and III would not be impacted because facility and infrastructure improvement projects are not planned to take place where

these plant species are located. Construction in undisturbed areas would be surveyed to determine presence of jurisdictional waters of the U.S. If jurisdictional waters are found then consultation with the USACE would be conducted prior to project initiation in undeveloped areas. Except in Area II, construction would not occur in areas likely to be inhabited by the chuckwalla. In Area II, surveys would be conducted prior to construction and any chuckwalla found would be removed. Similarly, Gila monsters would not be expected in , but if a Gila monster is encountered, State of Nevada protocols would be implemented. The western burrowing owl is common on the base and provisions of the Migratory Bird Treaty Act would be followed prior to the start of construction. These provisions include surveys, removal, and limiting ground disturbing activities to non-breeding season for the owls. Since projects involving sensitive areas would be looked at individually and the vast majority of the projects would be located on previously developed portions of the base, impacts to biological resources would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

#### **4.6.2 No-Action Alternative**

The proposed CIP would not be implemented, but some construction, demolition, or infrastructure improvement projects would be implemented in accordance with the old CIP. Impacts to vegetation, wildlife, or special-status species would require individual analyses on a project-by-project basis under the no-action alternative at Nellis AFB.

### **4.7 WATER AND SOIL RESOURCES**

In terms of water resources, no aspect of current operations at Nellis AFB affect either hydrologic setting or water sources; this would not change under the proposed action. Therefore, this analysis focuses on potential effects on water use, availability, and quality. The principal factors influencing stability of structures are soil and seismic properties. Soil, in general, refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support structures and facilities. Relative to development, soils typically are described in terms of their type, slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of land use.

A significant impact on water resources would (a) violate any water quality standards; (b) substantially deplete groundwater supplies or interfere substantially with groundwater recharge; or (c) otherwise substantially degrade water quality. A significant impact on soils would result in substantial soil erosion or loss of topsoil.

#### **4.7.1 Nellis AFB**

##### **Water Resources**

Under the proposed action, construction and demolition activities are expected to have no appreciable effects on the surface waters at Nellis AFB or in the surrounding areas. Surface water for Nellis AFB is transported via pipelines from Lake Mead. Sources of groundwater are available from the principal alluvial-fill aquifer underlying the Las Vegas Valley. Although implementation of the proposed projects would increase the use of water, the increase would be temporary. Affect on the availability of ground water at Nellis AFB or in the surrounding areas would be minimal.

Use of water for the proposed infrastructure improvement projects would not significantly affect availability of surface water or ground water at Nellis AFB or elsewhere in the area. Nellis AFB currently is allotted 4,000 acre feet per year from Lake Mead; anticipated increases due to construction and facility use are anticipated to be within current water allocation and would not require Nellis AFB to seek additional water rights. Construction of new facilities with more efficient water conservation design and measures and demolition of existing facilities would help offset any increased water use. Xeriscaping, or drought-tolerant landscaping, projects are planned throughout the base for conservation of water resources.

Projected on-base construction would disturb existing groundcover, but the potential for soil loss, erosion, and sedimentation would be temporary and limited in scope. There are several ephemeral streams in Area II away from proposed construction sites; however, no natural lakes, or other open bodies of water are present at Nellis AFB and no avenue for sediments to be introduced into surface waters exists.

The proposed action includes paving and construction of buildings with impermeable surfacing. If the area of disturbance for the proposed action is 1 acre or more, it is subject to National Pollutant Discharge Elimination System (NPDES) permit conditions. Nellis AFB would amend its existing NPDES permit to accommodate such construction. During construction at Nellis AFB, soils would temporarily be exposed to compaction, impeding drainage and reducing water infiltration. However, existing water filtration is limited due to the types of soils found at Nellis AFB. In addition, construction and demolition activities could increase runoff volumes and alter current hydrological processes. However, the base lacks significant open water bodies and the area altered would minimally impact the small portion (about 10 percent) of the existing permeable surfaces at Nellis AFB. The base's internal stormwater flow patterns might be redirected, but the main outfall discharge to Sloan Channel would remain the same. Since no surface water resources of consequence are located on base and there would not be any negligible increase and/or change from existing impenetrable surfaces, implementation of the proposed action would not adversely impact surface water. Existing spill prevention, control, and countermeasure procedures would provide for protection of surface water sources during construction and use of facilities, so the potential for base or off-base surface water quality to be affected would be negligible.

Construction and paving associated with the proposed improvement projects could result in slightly fewer acres available to facilitate groundwater recharge, but the impact would not be adverse given the low average annual precipitation, minimal recharge associated with the soils found at the base, and the lack of year-round surface water on the base. No floodplains have been identified on base. Since the existing potential for flooding on Nellis AFB is minimal, the proposed action would not increase flood hazards on the base. Impacts to water resources would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

### **Soil Resources**

Under the proposed action, construction of new facilities and demolition at Nellis AFB would occur over several years. Depending on the size of the area of disturbance for projects, they may be subject to conditions of existing NPDES permits. The existing Stormwater Pollution Prevention Plan would need to be updated to reflect these new facilities prior to construction. The Stormwater Pollution Prevention Plan

would specify measures to reduce or eliminate any adverse erosion and sedimentation impacts (e.g., culvert and storm water runoff drainage).

Site grading associated with construction of new facilities and demolition of existing facilities would be the primary activity with the potential to affect soils. Grading would cause loss of some disturbed ground cover for new facilities, which would increase the potential for soil erosion. However, several factors indicate that erosion and soil loss would be negligible. First, the area affected would primarily be within the developed portion of Nellis AFB. Most of the proposed construction would replace existing buildings. Second, construction activities would take place over 5 to 10 years, limiting the total area exposed to erosion at any point in time. Third, low precipitation (4 inches per year) and low runoff (0.2 to 2.1 inches per year), combined with the flat topography of the base would substantially reduce the potential for erosion. Lastly, Air Force requirements to employ standard construction practices (e.g., soil stockpiling, watering), and follow NPDES permits and Stormwater Pollution Prevention Plan requirements would further limit both wind and water erosion. Based on these factors, construction grading would not measurably degrade soil resources through erosion or loss. In summary, there would neither be adverse nor measurable impacts to soil resources if the proposed action were implemented.

Generic construction projects that do not have definitive locations or designs could impact ERP sites. Some proposed General Plan projects may also never occur. The impact of these projects on ERP sites is only able to be accessed in a general manner, using broad assumptions; specific analysis would be accomplished upon project approval. Usually, facilities can be located on ERP sites with an ERP waiver acquired from HQ ACC and the State. Design of the facility would need to make provisions for monitoring and/or ongoing remediation efforts if applicable. Planners would coordinate with the installation ERP manager for requirements and to apply for an ERP waiver. An ERP waiver must be obtained prior to construction. Impacts to soils and ERP sites would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

#### **4.7.2 No-Action Alternative**

Implementation of the no-action alternative would not implement the CIP and older substandard facilities would continue to be used. Nellis AFB would continue to manage the soils and water resources found on base in accordance with state and federal regulations.

### **4.8 AIR QUALITY**

A significant impact would occur if the project would violate any ambient air quality standard (NAAQS or state of Nevada); increase the number or frequency of violations; contribute substantially to an existing or projected air quality violation; conflict with or obstruct implementation of the applicable air quality plan; result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable ambient air quality standard; expose sensitive receptors to substantial pollutant concentrations; or create objectionable odors affecting a substantial number of people.

#### 4.8.1 Nellis AFB

According to EPA General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to cause violations in a NAAQS nonattainment area (i.e., Nellis AFB) must undergo a conformity analysis. Currently, portions of Clark County, Nevada, in the area around Nellis AFB are in non-attainment for 8-hour ozone (1997 Standard) and PM<sub>10</sub>, and occur in a maintenance area for CO. Therefore, the analytical approach evaluated the greatest amount of ground-disturbance activities that could occur in a given year before *de minimis* thresholds for VOCs, NO<sub>x</sub>, PM<sub>10</sub> or CO would be exceeded.

Two demolition/construction scenarios were developed to calculate *de minimis* thresholds for pollutant emissions. The primary emissions for the activities would be fugitive dust and exhaust emissions from transport vehicles and heavy equipment. Scenario 1 modeled demolition of a two-story, 2,000 square-foot concrete building located on 1 acre of land, and 3 acres of construction for a 30,000 square-foot concrete maintenance shop with a 100,000 square-foot parking lot. Scenario 2 increased demolition to 3 acres and tripled the sizes of the building and parking lot to be demolished. Construction under Scenario 2 tripled the sizes of the building and parking lot and the overall project disturbance area increased to 10 acres. These scenarios assumed that all best management practices, such as watering loose soil and avoiding unnecessary periods of engine-idle, would be in place.

In both scenarios, estimated emissions would be below *de minimis* levels, but in the second scenario, PM<sub>10</sub> were estimated to be within 3.5 tons of the *de minimis* threshold of 70 tons per year. Table 4.2 contains the results of the emissions calculations and Appendix B provides the worksheets from which these figures were derived.

The majority of the proposed CIP projects typically would average less than a quarter acre in size. Road and airfield projects would be larger; however, most would be less than a few acres. In addition, funding and manpower constrain the amount of development that could occur in a single year. Therefore, any impacts to air quality in any year would be expected to generate emissions below *de minimis* thresholds.

| <b>Table 4-2. Nellis AFB Projected Scenarios Pollutant Emissions (tons/year)</b> |             |           |                       |                       |                        |                         |                           |
|--|-------------|-----------|-----------------------|-----------------------|------------------------|-------------------------|---------------------------|
|  | <b>VOCs</b> | <b>CO</b> | <b>NO<sub>x</sub></b> | <b>SO<sub>2</sub></b> | <b>PM<sub>10</sub></b> | <b>PM<sub>2.5</sub></b> | <b>CO<sub>2</sub></b>     |
| Scenario 1   | 0.30        | 2.14      | 4.49                  | 0.07                  | 20.39                  | 2.24                    | 424                       |
| Scenario 2   | 1.35        | 8.50      | 20.80                 | 0.35                  | 66.53                  | 7.53                    | 1,844                     |
| <i>de minimis</i> threshold  | 100         | 100       | 100                   | <sup>1</sup> NA       | 70                     | <sup>1</sup> NA         | <sup>2</sup> NA           |
| Exceedance?  | No          | No        | No                    | NA                    | No                     | NA                      | <sup>2</sup> NA           |
| U.S. 2010 Total GHG Emissions  |             |           |                       |                       |                        |                         | 6,821.8 x 10 <sup>6</sup> |

Source: *De minimis* thresholds obtained from 40 CFR 93.153

<sup>1</sup>NA means Not Applicable. The region, including Nellis AFB, is in attainment for SO<sub>2</sub> and PM<sub>2.5</sub>; therefore there are no applicable *de minimis* thresholds.

<sup>2</sup>*de minimis* thresholds are not applicable to greenhouse gases.

Annual GHG emissions associated with the Proposed Action were compared to U.S. 2010 GHG emissions. The estimated annual GHG emissions attributed to the proposed construction activities under Scenario 2 are less than three hundred thousandth of 1 percent of the total CO<sub>2</sub> emissions generated by the United States in 2010. Emissions of GHGs from the Proposed Action alone would not cause appreciable global warming that would lead to climate changes. However, these emissions would increase the atmosphere's concentration of GHGs, and in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate

change. At present, no methodology exists that would enable estimating the specific impacts (if any) that this increment of warming would produce locally or globally.

Note that regardless of the results of a conformity analysis for any project, Clark County air regulations would still apply. The installation would therefore need to determine whether fugitive dust and authority to construct permits would be required and would need to apply for and follow such permits as necessary.

#### **4.8.2 No-Action Alternative**

Under this alternative, planning for additional facilities would not would the proposed CIP. Some construction would continue using the old CIP and on a case-by-case basis for specific activities on Nellis AFB. Impacts to air quality would require individual analyses on a project-by-project basis under the no-action alternative at Nellis AFB to determine the appropriate permit requirements. For instance, a dust control permit is required for soil disturbing or construction activities that impact 0.25 acres or more, mechanical trenching 100 feet or greater, or mechanical demolition of any structure 1,000 square feet or greater.

### **4.9 HAZARDOUS MATERIALS AND WASTE**

The nature and magnitude of potential impacts associated with hazardous and toxic materials and wastes depends on the toxicity, storage, use, transportation, and disposal of these substances. The threshold level of significance for hazardous materials, toxic substances, and hazardous waste is surpassed if the storage, use, handling, or disposal of these substances substantially increases the risk to human health due to direct exposure, substantially increases the risk of environmental contamination, or violates applicable federal, state, DoD, and local regulations.

#### **4.9.1 Nellis AFB**

Construction and maintenance activities associated with the General Plan actions would require the use of hazardous substances, such as petroleum, oil, and lubricants. During construction, use of these substances for fueling and equipment maintenance would have the potential for minor spills and releases. Use of best management practices, such as secondary containment for construction vehicles and storage containers, would ensure that these substances would not be released into the environment.

Asbestos may be encountered as structures are remodeled or demolished to accommodate new support facilities. It is current Air Force practice to remove exposed friable asbestos and manage other asbestos-containing materials in place, depending on the potential threat to human health. Friable asbestos, if encountered would be removed by licensed contractors and disposed of in an appropriate disposal facility.

All materials purchased and used in construction projects on Nellis AFB are tracked through the HAZMART which manages the procurement, handling, storage, and issuing of hazardous materials used on Nellis AFB. The Air Force would continue to manage the 90-day CAPs for hazardous waste generators. Basic processes and waste handling and disposal procedures for wastes generated at Nellis AFB are identified in the Nellis AFB Hazardous Waste Management Plan 12 (Air Force 2010d). These procedures are equipped to handle potential waste increases due to implementing the CIP projects. It is possible, but unlikely, for one of the proposed projects to introduce a new waste stream; however, it

would be characterized to determine the correct waste disposition. Nellis AFB would continue to be responsible for ensuring that any hazardous waste generated is disposed of in compliance with all federal, state, and local regulations.

Standard design and construction techniques would be employed to ensure that no hazardous fumes permeate facilities, such as use of clean fill and vapor barriers. Environmental program managers review project designs and inspect construction activities to ensure that appropriate engineering controls are in place. Impacts from hazardous materials and waste operations would apply to either Scenario 1, light construction, or Scenario 2, heavy construction.

#### **4.9.2 No-Action Alternative**

CIP projects would not occur under the no-action alternative. Some construction, demolition, or renovation would still occur using the old CIP; therefore, hazardous materials and waste impacts resulting from the no-action alternative would only be slightly increased from current conditions. Pollution prevention measures are the same for all construction and demolition projects, regardless of the existence or status of a general plan.

### **4.10 SAFETY**

In evaluating safety, the impacts would be considered adverse if human safety would be threatened.

#### **4.10.1 Nellis AFB**

During construction and demolition, all actions would be performed in accordance with AFOSH directives and Occupational Safety and Health Administration regulations. There are no specific aspects of construction or demolition projects that would create any unique or extraordinary safety issues. The handling, processing, storage, and disposal of hazardous by-products from these activities would be accomplished in accordance with all federal, state, and local requirements, as well as applicable Nellis AFB plans. All current day-to-day operations have established safety guidelines and procedures which would continue to be observed. No adverse impact to safety would be anticipated under the proposed action. Long-term beneficial impacts from installation of traffic roundabouts or rerouting vehicles away from high-density pedestrian areas would result in safer consumer areas of the base. Additionally, Perimeter Road would be relocated around the clear zone of the runways to eliminate safety and security hazards.

#### **4.10.2 No-Action Alternative**

CIP projects would not occur under the no-action alternative. Some construction, demolition, or renovation would still occur using the old CIP; therefore, safety impacts resulting from the no-action alternative would only be slightly increased from current conditions.

### **4.11 NOISE**

In terms of aircraft operations, changes in noise levels of 3 dB or greater would constitute a significant change in the noise environment. However, to achieve such changes would require doubling of the

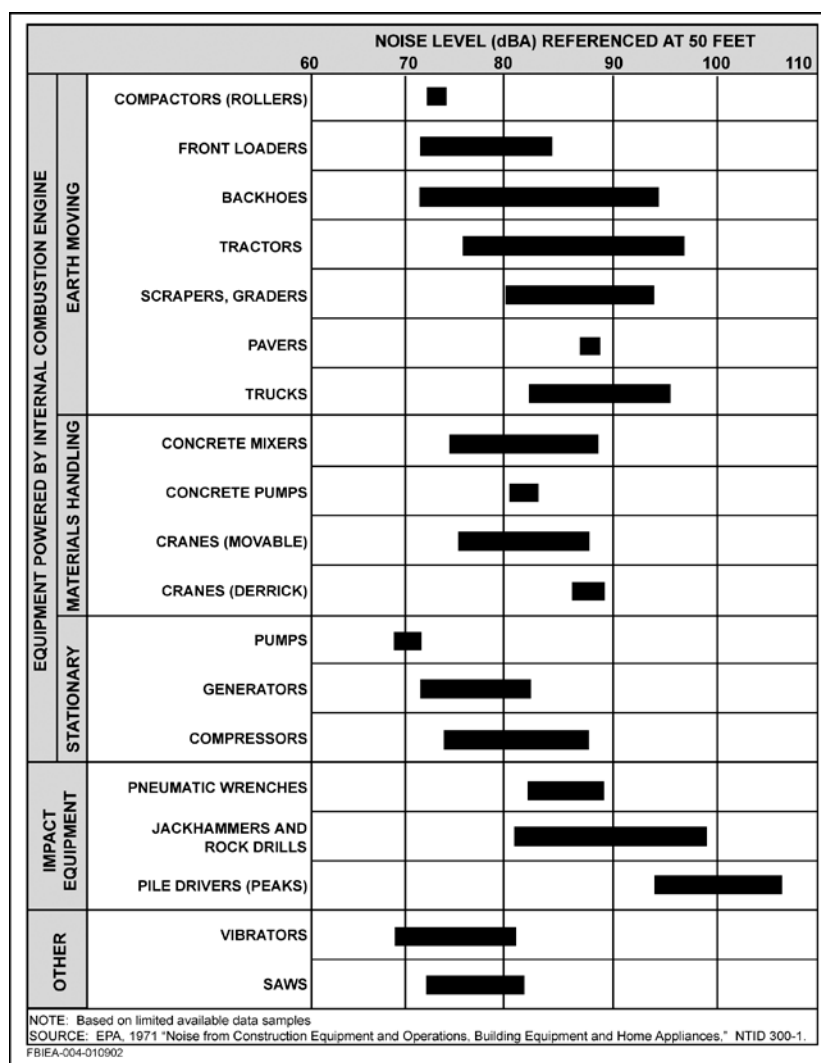


number of operations at either base. No part of the proposed action would produce changes in operations. Relative to construction, significant effects from noise would need to exceed occupational health and safety standards. All construction would operate with appropriate time and duration constraints, thereby adhering to required standards.

#### **4.11.1 Nellis AFB**

The prime generator of noise at Nellis AFB is aircraft operations. For the proposed action, noise primarily would be derived from two sources: construction/demolition activities and vehicle traffic associated with the same construction/demolition activities. Other sources, such as aircraft operations would remain consistent with existing conditions and would not change under the proposed action.

To characterize construction activity noise levels, EPA data (USEPA 1971) were used (Figure 4-1). Based on the EPA criteria, construction noise resulting in an hourly equivalent sound level of 75 dBA at a sensitive receptor would represent a significant impact. Noise from construction activity varies with the types of equipment used and the duration of use. During operation, heavy equipment and other construction activities generate noise levels ranging typically from 70 to 90 dBA at a distance of 50 feet. Commonly, use of heavy equipment occurs sporadically throughout the daytime hours.



**Figure 4-1. Typical Construction Equipment Noise Levels**

To evaluate the potential noise that could be generated during construction and demolition activities, the two scenarios that were used in the air quality analysis were adopted. Under Scenario 1, the greatest noise levels would be generated during demolition debris removal and could reach a maximum of 76 dBA 50 feet from the site; at 500 feet noise would decrease to 61 dBA; and at 2,000 feet, noise generated from demolition activities would be 52 dBA. For Scenario 2, construction of the 30,000 square-foot building would generate a noise level of approximately 79 dBA at 50 feet from the construction site; at 500 feet the noise level would be 64 dBA; and at 2,000 feet construction related activities would generate about 55 dBA.

Nellis AFB has not determined the exact projects to be undertaken, when they would occur, or in what order they would occur. These are variables based on funding availability, mission needs, and other unforeseen circumstances for which project priorities are determined. Regardless of these unknown factors, construction/demolition activities at Nellis AFB would occur over a multi-year timeframe, and minimal to negligible impacts from construction noise would result for the following reasons:

- Heavy equipment that would generate the highest noise levels would not be used consistently enough to exceed the hourly equivalent noise level of 75 dBA for more than 1 hour and would be within the boundaries of Nellis AFB.
- A majority of construction and demolition projects occur within the vicinity of the flightline and for Nellis AFB, this area currently receives noise levels consistent with or greater than those that would be emanating from construction/demolition activities.
- Construction/demolition activities would be expected to occur between 7:30 a.m. and 4:30 p.m.
- Temporary increases in truck (e.g., dump trucks, fill transports) traffic within and near the construction corridor would produce localized noise for brief periods, but would not create any adverse noise impacts to human health, the neighboring communities, or within the base.

In general, construction and demolition noise at Nellis AFB would be intermittent and short-term in duration, and no long-term (recurring) noise impacts would result from implementation of the proposed action. Noise contours would remain unchanged from existing conditions.

#### **4.11.2 No-Action Alternative**

CIP projects would not occur under the no-action alternative. Some construction, demolition, or renovation would still occur using the old CIP; therefore, noise impacts resulting from the no-action alternative would only be slightly increased from current conditions.

## **CHAPTER 5**

# **CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

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## **5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

### **5.1 CUMULATIVE EFFECTS**

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). CEQ guidance in *Considering Cumulative Effects* affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider other projects that coincide with the location and timetable of the proposed action and other actions. Cumulative effects analysis must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur concurrently or in a similar location. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects the analysis needs to address three fundamental questions:

1. Does a relationship exist such that elements of the proposed action might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
3. If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

#### **5.1.1 Scope of Cumulative Effects Analysis**

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the affected area defines the geographic extent of the cumulative effects analysis. This area includes Nellis and Creech AFBs and their vicinities, including Las Vegas Valley and Indian Springs. Examination of other actions not occurring within or adjacent to this affected area reveals that they lack the necessary interactions to result in cumulative effects.

Past actions within the two affected areas relate predominantly to activities on and use of Nellis and Creech AFBs. Under the no-action alternative, the current environmental conditions of the affected area underwent analysis in this EA. Since those conditions represent the result of long-term use occurring at Nellis and Creech AFBs, analysis of the no-action alternative has considered those past and present effects engendered by the operation and use of the base. Previous analyses addressing the affected area include *BRAC Environmental Assessment for Realignment of Nellis AFB* (Air Force 2007), *WINDO EA* (Air Force 2006a) and *F-35 FDE and WS Beddown at Nellis AFB, Nevada Environmental Impact Statement* (Air Force 2011a).

Another factor influencing the scope of cumulative effects analysis involves identification and consideration of other actions. Beyond determining that the geographic scope and time frame for the actions interrelate with the proposed action, the analysis employs the measure of “reasonably foreseeable” to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to define other actions included notices of intent for EISs and EAs, management plans, land use plans, other NEPA studies, and economic and demographic projections.

### **5.1.2 Cumulative Effects of Reasonably Foreseeable Actions**

Actions potentially relating to the cumulative effects for implementing the CIP update for Nellis and Creech AFBs could include those of the DoD, Department of Energy, Department of the Interior, and local counties. The following outlines these actions and assesses their relationship to the proposed action and alternative.

#### **DoD Actions**

Nellis and Creech AFBs are active military installations that undergo continuous change in mission and in training requirements. This process of change is consistent with the United States defense policy that the Air Force must be ready to respond to threats to American interests throughout the world. Mission and training requirements have resulted in facility construction and upgrades on Nellis and Creech AFBs.

By far the largest reasonably foreseeable action is the proposed beddown of the F-35 aircraft for Nellis AFB. This action would include 36 new aircraft and construction of numerous facilities. An EIS was completed for this action in 2011. Where available and applicable to the proposed action of this document, cumulative impacts are presented here. The F-35 action is clearly larger than this proposal and environmental impacts resulting from that action would dominate all other actions relative to Nellis AFB.

Two other projects contributing to current and planned construction activities are the BRAC Realignment at Nellis AFB and the Predator Force Structure Changes at Creech AFB. These proposals are currently underway and construction activities for these actions receive priority because of the emerging mission needs. Many of the BRAC and Predator projects are currently funded.

Similar to this proposed action, the WINDO projects at Nellis AFB, Creech AFB, and Tonopah Test Range included repair, maintenance, installation, renovation, construction, and demolition. The Air Force has determined the WINDO projects are necessary for Nellis AFB to achieve its myriad test, training, and evaluation missions, both now and in the future. Nellis AFB would ensure that these goals are not only achieved, but also maximized.

Most (554) of the WINDO projects consist of minor improvements, repairs, and maintenance projects that represent routine activities as classified under 32 CFR Part 989, Air Force EIAP, and result in negligible effects to the environment. However, 77 proposed projects would involve new construction, expansion, or demolition of facilities and infrastructure. Nellis AFB would support most (45) of these projects, ranging from construction of a shoppette to construction of a rappel tower. All of these proposed projects would occur within functionally compatible areas on the base. Given their functional relationships with existing facilities, these projects would be sited on previously used and disturbed ground.

The WINDO EA describes numerous facility and infrastructure repairs and maintenance activities, but also describes some new construction. The WINDO construction projects and the projects under this proposed action would be sited on functionally similar areas. The list contains over 40 projects that carried over from previous years and projects slated for later could be moved forward. Traditionally, only a fraction actually in ensuing years, other projects listed will be based on mission needs and priorities and some will be demolished as they become non-functional. This is a typical growth pattern found in any town.

Unlike many towns, Nellis and Creech AFB boundaries are finite that limits the potential for growth. Large safety and security zones are necessary for military installations, thus further limiting most of the growth for Nellis and Creech AFBs to infill construction. The phenomenal growth experienced by the Las Vegas metropolitan areas is not possible for the bases. As a result of these limitations, careful planning is required and the potential for the cumulative impacts are lessened to some degree because of limiting factors such as the explosive safety arcs associated with the live ordnance loading areas and live ordnance departure areas (LOLA/LODA).

### **Local Actions**

While not involving specific actions, planning and anticipated growth in local cities as well as Clark, Nye, and Lincoln counties in Nevada represent factors worthy of consideration for cumulative effects when combined with the proposed action. Nellis and Creech AFBs, and the city of Las Vegas and the town of Indian Springs lie within Clark County. Census data and other information indicate that Clark County exhibited the greatest growth in population within the United States over the last 15 years. From 1990 through 2000, the population increased approximately 86 percent. Estimates for 2005 place the county population at 1.69 million people representing a 128 percent increase since 1990. This amount exceeds that anticipated in the Regional Transportation Plan for Clark County (Regional Transportation Commission 1994), which anticipated that Clark County's population would increase to approximately



1.2 to 1.4 million persons by 2005. While the population growth in Clark County has slowed from the boom years of the early 2000s, the growth and economic development in Clark County far overshadows the influence of Nellis AFB. As such, the minimal effects on local socioeconomic conditions from the CIP update actions would not be perceptible given the context.

### **5.1.3 Assessment of Cumulative Effects by Resource Area**

Analysis of the proposed action resulted in a finding of no direct or indirect effects on socioeconomics and infrastructure; cultural resources; and hazardous materials and waste. Therefore, these resources will not be discussed further in this section. This analysis of the proposed action indicated that cumulative effects of other actions could interact with potential direct or indirect effect on noise, air quality, water and soil resources, and biological resources. The following analyzes these resources further.

#### **Conservation Measures**

Energy and water conservation, recycling, and habitat conservation considerations have been incorporated into many, if not all of the proposed CIP projects. Some are specifically designed to improve the environment, such as installing water efficient landscaping, while others would utilize environmentally friendly systems such as, higher efficiency HVAC systems and water conserving faucets. Similarly, many facilities in the community are also moving towards this trend of “green” construction. Cumulatively, the impacts to the rapid growth of the Las Vegas Valley and Nellis and Creech AFBs are somewhat abated through better planning and engineering to reduce the use of consumptive resources. Naturally, the impacts would be least if the no growth occurred, but utilizing “green” construction techniques result in less impact than construction that doesn’t attempt to conserve resources.

#### **Noise**

No change in noise would result from the proposed action. As such, it could not combine with any other action to produce cumulative effects. Construction noise from proposed projects would be temporary and short-term in nature. No location would experience a permanent increase in noise. Proposed basing of the F-35 would generate the most noise impact, more than any of the rest combined. Since the CIP and ADPs do not involve any new aircraft, the noise impact associated with flying operations would be unchanged. Since the CIP updates would not produce a perceptible change in noise levels, it would not be additive to the noise from other actions at Nellis and Creech AFBs and, therefore, no cumulative impacts would be anticipated.

## Air Quality

Cumulative impacts from multiple actions occurring simultaneously on the installation include emissions from construction and airfield operations due to overlap of the CIP update actions, BRAC action and post-BRAC alternative, and the proposed F-35 beddown. The F-35 beddown action is a large multi-year project involving both construction and aircraft-related emissions during the course of the action, beginning in fiscal year (FY) 09. Specifically, the years FY09 through FY12 constitute the primary overlap period with construction, operations, and commuting. While cumulative emissions would exceed the minimal quantities generated by the proposed action, they would not pose a conformity problem under the CAA. Conformity regulations apply only to individual projects. The air quality calculations presented in Chapter 4 for the proposed action also apply to these other foreseeable actions.

Table 5-1 shows the projected air pollutants expected from the proposed F-35 beddown at Nellis AFB, as projected in the beddown EIS (Air Force 2011a). Construction for that project would begin in 2009 and the first aircraft were scheduled to arrive in 2012, but due to production delays the aircraft will be arriving several years later.

Projected construction activities associated with the proposed action, as identified in the EIS, are not anticipated to exceed de minimis for any year.

| <b>Table 5-1. Projected Pollutant Emissions (tons/year) from Combined Construction, Commute, and Aircraft Operations Compared to Conformity Thresholds</b> |              |               |             |              |
|--|--------------|---------------|-------------|--------------|
| 2012   |              |               |             |              |
| Aircraft   | 12.00        | 28.00         | 1.00        | 8.00         |
| AGE  | 6.08         | 3.09          | 0.51        | 0.16         |
| Commuting Personnel  | 12.36        | 0.79          | 0.98        | 0.03         |
| Construction Workers Commuting   | 0.10         | 0.01          | 0.01        | 0            |
| <b>Total</b>   | <b>30.54</b> | <b>31.89</b>  | <b>2.50</b> | <b>8.19</b>  |
| 2013   |              |               |             |              |
| Aircraft   | 12.00        | 28.00         | 1.00        | 8.00         |
| AGE  | 6.08         | 3.09          | 0.51        | 0.16         |
| Commuting Personnel  | 11.82        | 0.72          | 0.91        | 0.03         |
| Construction   | 3.91         | 7.75          | 0.92        | 14.11        |
| <b>Total</b>   | <b>33.81</b> | <b>39.56</b>  | <b>3.34</b> | <b>22.30</b> |
| 2014   |              |               |             |              |
| Aircraft   | 12.00        | 28.00         | 1.00        | 8.00         |
| AGE  | 6.08         | 3.09          | 0.51        | 0.16         |
| Commuting Personnel  | 11.37        | 0.67          | 0.86        | 0.03         |
| Construction   | 2.13         | 2.07          | 0.30        | 1.38         |
| <b>Total</b>   | <b>31.58</b> | <b>33.83</b>  | <b>2.67</b> | <b>9.57</b>  |
| 2015   |              |               |             |              |
| Aircraft   | 25.00        | 55.00         | 2.00        | 17.00        |
| AGE  | 12.16        | 6.18          | 1.02        | 0.32         |
| Commuting Personnel  | 11.37        | 0.67          | 0.86        | 0.03         |
| <b>Total</b>   | <b>48.53</b> | <b>61.85</b>  | <b>3.88</b> | <b>17.35</b> |
| 2017   |              |               |             |              |
| Aircraft   | 50.00        | 110.00        | 4.00        | 34.00        |
| AGE  | 24.32        | 12.36         | 2.04        | 0.64         |
| Commuting Personnel  | 19.82        | 1.17          | 1.50        | 0.05         |
| <b>Total</b>   | <b>94.14</b> | <b>123.53</b> | <b>7.54</b> | <b>34.69</b> |

| <b>Table 5-1. Projected Pollutant Emissions (tons/year) from Combined Construction, Commute, and Aircraft Operations Compared to Conformity Thresholds (con't)</b> |               |                       |              |                        |
|--|---------------|-----------------------|--------------|------------------------|
|  | <i>CO</i>     | <i>NO<sub>x</sub></i> | <i>VOCs</i>  | <i>PM<sub>10</sub></i> |
| 2022   |               |                       |              |                        |
| Aircraft   | 75.00         | 165.00                | 6.00         | 50.00                  |
| AGE  | 36.48         | 18.54                 | 3.06         | 0.96                   |
| Commuting Personnel  | 21.10         | 1.25                  | 1.60         | 0.05                   |
| <b>Total</b>   | <b>132.58</b> | <b>184.79</b>         | <b>10.66</b> | <b>51.01</b>           |
|  |               |                       |              |                        |
| <i>De minimis</i> Threshold (tons/year)  | 100           | 100                   | 100          | 70                     |

The NO<sub>x</sub> emissions due to the F-35 beddown would exceed *de minimis* levels. Clark County Department of Air Quality (CCDAQ) has agreed to include these proposed NO<sub>x</sub> emissions in their updated SIP (CCDAQ 2008).

### **Water and Soil Resources**

Construction of new facilities under the CIP updates, proposed F-35 beddown and the BRAC realignment poses a potential for impact on soils, including soil loss and erosion. However, several factors indicate that erosion and soil loss would be negligible. Precipitation in the Nellis AFB and Creech AFBs areas are low, most construction would occur on previously developed land, and the Air Force and Clark County require employment of standard construction practices. Overall, the proposed action combined with the other planned construction would not result in potential incremental impacts from ongoing activities and no cumulative adverse impacts to soils.

This action would generally use water for construction purposes and long-term water use would typically be for office space restrooms. Additionally, a number of the projects replace heavily irrigated lawns with xeriscape and other projects designed to reduce water use. Personnel using the planned CIP projects would be personnel already located on base the proposed action does not include additional personnel at Nellis or Creech AFBs. Combined construction activities and population growth of Nellis and Creech AFBs are not expected to have appreciable cumulative effects on the water resources at either base. Construction activities would be temporary and water use limited to less than 1 percent of the base's daily allotment. Nellis AFB is currently allotted about 7.1 million gpd of combined surface and groundwater sources, and full implementation of the proposed action and other beddowns (i.e., BRAC and proposed F-35) would result in use of approximately 355,180 gpd to 446,419 gpd, which is well within Nellis AFB's water allocation. Since this water use is well below the allocation, it is unlikely that the cumulative effects of the proposed action would have significant adverse effect on water resources at Nellis AFB and in the surrounding area. Creech AFB has a requirement for 88,000 gpd and cumulative impacts from proposed projects should not affect water supply at Creech AFB to any significant level as few, if any, additions of personnel are planned. Since there are other proposals contributing to the population of the bases, personnel on Nellis AFB monitor the proposals to assure that water is available for the proposed growth.

## **Biological Resources**

An aspect of the CIP update, BRAC realignment, and the F-35 beddown proposal common to all actions would be an increase of the ramp on the east side of the Nellis AFB airfield. The BRAC action would increase the size of the east ramp by 375,000 square feet, the proposed F-35 expansion would be similar in size. The eastern corner of the ramp could intersect a portion of an ephemeral wash, and water runoff from the ephemeral wash could potentially intersect with the Range Wash. The Range Wash represents a water of the U.S., therefore, a Section 404 permit in accordance with the CWA may be required. Cumulatively, the potential impacts to this area would be isolated to only the base because Range Wash empties into a large retention basin located at the boundary of the base. Further downstream from the retention basin flows are constrained to man-made concrete and/or soil lined channels. Because the impacts would be confined to the base, there would be no cumulative impacts associated with the additional ramp space on the east side of the base.

Combined impacts to vegetation would be insignificant due to the already disturbed nature found at all locations. Wildlife impacts would be minimal given the already disturbed nature of each proposed infrastructure improvement location. Combined impacts to rare plant species would be insignificant since Las Vegas Bearpoppy and Las Vegas Buckwheat exist in Areas II and III. Areas affected by construction of CIP projects would be in areas not likely to contain these rare plant species. Clark County, the Bureau of Land Management and National Park Service currently provide efforts to conserve populations of these plants; therefore, no adverse cumulative impacts would occur to rare plants. Combined impacts to the desert tortoise known to exist in the vicinity surrounding Creech AFB would be limited to potential loss of desert tortoise habitat and individuals. Due to the low concentrations of the desert tortoise found in these locations and adherence to the measures required by USFWS Biological Opinions (USFWS 2007, 2003), these impacts would be insignificant.

## **5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural resource).

For the CIP proposed actions, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or longer lasting but negligible. Those limited resources that may

involve a possible irreversible or irretrievable commitment under the proposed action are discussed below.

Facilities construction and maintenance for support activities would require consumption of limited quantities of aggregate, steel, concrete, petroleum, oil, and lubricants. Construction would occur on previously disturbed areas or in areas lacking significant habitat or concentrations of wildlife, so no irreversible loss of habitat and wildlife would result. No eligible or National Register properties are in the Area of Potential effect. Similarly, construction on both bases would avoid significant cultural resources. Any discoveries of cultural resources during construction or infrastructure upgrades would evoke an investigation and evaluation according to procedures in 36 CFR Part 60 and the Nellis AFB Integrated Cultural Resources Management Plan to ensure preservation of the resources. While construction of new facilities on the bases would incur some soil disturbance and loss, measures to localize and minimize soil loss would be implemented. The Air Force would continue to comply with all requirements of the USFWS Biological Opinions and subsequent modifications to minimize desert tortoise mortality, harassment, or habitat destruction on Nellis and Creech AFBs (USFWS 2007, 2003).

Personal vehicle use by the staff proposed to support the CIP activities would consume fuel, oil, and lubricants. The amount of these materials used would not exceed that currently used by these same individuals and their families. Construction in the region would occur regardless of the specific location and this activity does consume fuel. However, Nellis AFB has installed a Solar Photovoltaic System (PVS), which offsets non-renewable energy consumption, and an additional Solar PVS is planned for Creech AFB. Also, the ECIP projects and improvements will assist in curtailing energy consumption. In the long term, non-renewable energy used for the projects will be offset by these energy saving measures.

## **CHAPTER 6**

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## **CHAPTER 7**

### **PERSONS AND AGENCIES CONTACTED**

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## **7.0 PERSONS AND AGENCIES CONTACTED**

Fueller, Stan. 99 CES/CENPP. Nellis AFB, Nevada 2012.

Haarklau, Lynn. 99 CES/CENP. Nellis AFB, Nevada. 2012.

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Oppenborn, Tod. 99 CES/CENPD. Nellis AFB, Nevada. 2012

Rodriquez, Victor. 99 CEN/CENPD. Nellis AFB, Nevada. 2012

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## **CHAPTER 8**

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## **APPENDIX A**

# **NELLIS AFB CAPITAL IMPROVEMENTS PROGRAM**

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## APPENDIX A

### NELLIS AFB CAPITAL IMPROVEMENTS PROGRAM

The Nellis AFB CIP is a component of the planning process that provides the installation and unit commanders with up-to-date development possibilities for the base. The CIP is used in conjunction with the Base Comprehensive Asset Management Plan (BCAMP), as well as changes to the Installation Priority List (IPL) and to assist planners in compliance with the overall vision of the respective missions of Nellis AFB. Asset management principles of determining current condition of facilities and infrastructure, assignment of mission importance to the asset, and other factors such as, cost of restoration, sustainment, and or modernization or replacement of facilities combine to set priority levels for each project. Along with recommendations from installation and unit leadership, the IPL integrates the priorities of each unit and determines the overall priorities for the base. The list is forwarded to Headquarters Air Combat Command for approval and funding.

The projects described in the CIP list all of the proposed projects which have been identified as a bona fide need by the individual proponents of each action. These projects are reviewed by the Civil Engineering Facility Review Board and approved by the 99<sup>th</sup> Air Base Wing Commander based upon criteria including mission requirements, quality of life, degradation of existing facilities, and other factors. While the list includes hundreds of projects, funding for all of the projects to be completed in the next 5 years is not feasible because of the limited amount of funds available. These funding limitations are due to the war in Southwest Asia; competing funding requests from every other military installation; new missions such as the proposed F-35 Joint Strike Fighter (JSF) beddown; and general budget reductions for civil engineering projects. As a result, only a small percentage of the projects can be funded within one fiscal year. Projects not funded are carried over to the following fiscal year; in fact, many projects are still on the list that date back to the early 2000's or before. A full list of acronyms is found after the tables.

New construction, additions, remodels, demolition, maintenance, and repair comprise types of projects on the BCAMP list and are further broken down by type, such as facilities, utilities, roads, airfield, administrative, recreation, and others. Table A-1 identifies the improvement types of work, definitions and examples for improvements by the type of activity.

| <b>Table A-1. Capital Improvements Identification by Activity Type</b> |   |   |
|--|---|---|
| <b>Activity</b>  | <b>Definition</b>   | <b>Examples</b>   |
| Construction   | New construction or addition, expansion, and renovation to existing facilities. All new construction must meet energy savings requirements. | Includes construction of buildings, roads, mission operation facilities, pads, access roads and parking lots and landscaping  |
| Repair/Replace   | Repair and/or replace existing equipment and infrastructure   | Repair equipment, parking lots, manhole covers, fences, sprinkler system, as well as fuel tanks; install exterior lighting, also includes replacing existing landscaping with xeriscaping |
| Installation   | Installation of equipment, signs, utilities etc. to enhance the functionality of existing infrastructure                                    | Install equipment to maintain operational mission such as emergency power, check valves, heating and air conditioning units, force protection, under-wing foam system, and fire hydrants  |
| Maintenance  | Routine maintenance   | Routine maintenance to landscaping, road/parking lot pavement, ramps, water tanks,  |

| <b>Table A-1. Capital Improvements Identification by Activity Type</b> |  |   |
|--|--|---|
| <b>Activity</b>  | <b>Definition</b>  | <b>Examples</b>   |
|  |  | and hangars   |
| Demolish   | Demolition of existing infrastructure  | Demolish roads, aged dormitories, buildings, pads, etc., potentially not related to new construction                  |
| Environmental  | Monitoring and/or remediation of environmental spill sites, or other contracted documents such as Remedial Action Plans, Spill Response Plans, and Permit Fees | Long-term monitoring or planned remediation of identified sites, plans and permits which do not have physical impacts |

Table A-2 identifies the infrastructure types existing on Nellis AFB and the variety of activities that are accomplished on each infrastructure type. For example, airfield improvements could involve construction, repair, maintenance, demolition, and perhaps, environmental remediation activities.

| <b>Table A-2. Capital Improvements Identification by Infrastructure Type</b>                  |   |  |
|---|---|--|
| <b>Facility Type</b>  | <b>Definition</b>   | <b>Examples</b>  |
| Facilities  | Building construction or additions. This could include new, modular, addition/remodel, or storage facilities.                                   | Includes all of the difference classes of buildings; industrial, administrative, community service, etc. An example of a holding pad would be a munitions storage pad. |
| Airfield  | Maintenance, installation, and repair of airfield pavements and airfield related equipment  | Revetment, paint taxi lines, install runway shoulders, extend/repair flight line, maintain airfield pavement, and aircraft arresting systems                           |
| Utilities   | Installation and repair   | Repair and install communication, electrical, sewer, natural gas, and water lines, and water conservation projects   |
| Roads   | Installation, repair or maintenance of roads, sidewalks and parking lots  | roads, parking lots, etc. this also includes signal lights, roundabouts, and deceleration lanes  |
| Security  | Installation, construction, repair or maintenance of Antiterrorism/Force Protection items designed to improve the security of the installation. | Fencing, security barricades, lighting, security cameras, and vehicle inspection areas. Vegetation clearing and perimeter roads could fall in this category            |
| Fences/walls  | Perimeter structures primary for force protection and/or aesthetics   | Fences and block walls, includes dumpster enclosures, fence line lighting and security equipment   |
| Energy Conservation Improvement Program (ECIP) and <i>Greening of the Government</i> Projects | Installing and/or retrofitting systems and equipment which directly or indirectly result in energy savings                                      | Photovoltaic Arrays, window film, HVAC controls, day-lighting projects   |
| Recreation and quality of life projects   | Installing or repairing recreational areas, unit gathering places, or items to improve worker comfort and well being                            | Volleyball courts, horseshoe pits, pavilions and barbeque areas  |

Projects Further definitions of various types of CIP activities are; construction of current mission and future mission (primarily F-35 aircraft basing) facilities, restoration, modernization, and sustainment projects with definitions provided below.

**MILCON (Military Construction)** includes construction activity of sufficiently large scope to require Congressional approval for funding and has the most potential for environmental impacts. All new

facilities would be designed to comply with the Nellis AFB Design Compatibility Guidelines, August 2006 and major building projects must also comply with the Air Force Policy Memorandum requiring Leadership in Energy and Environmental Design (LEED) Green Building Rating System as the Air Force preferred self-assessment metric. The standards require energy saving building techniques, supplies and equipment to reduce environmental impacts and provide for energy savings from the construction and operation of these new facilities.

**Restoration** includes repair and replacement work to restore facilities damaged by inadequate sustainment, excessive age, natural disaster, fire, accident, or other causes to such a condition that it may be used for its designated purpose.

**Modernization** includes alterations of facilities to implement new or higher standards, including regulatory changes to accommodate new functions (including new mission beddowns), or to replace building components that typically last more than 50 years.

**Sustainment** includes maintenance and repair activities necessary to keep an inventory of facilities in good working order. Sustainment includes deferred sustainment such as anticipated major repairs or replacement of components that occur periodically over the expected service life of the facilities.

Table A-3 represents MILCON projects to support missions currently based and conducted from Nellis AFB such as; the Security Forces, Red and Green Flag, communications, and the fire department. Due to the current budget limitations, very few MILCON projects that are not associated with major programs such as the F-35 program are expected to receive any funding. Although analyzed in the F-35 Force Development Evaluation (FDE) and Weapon School (WS) Environmental Impact Statement (EIS), Table A-4 lists the F-35A MILCON Construction Projects. Tables A-5 and A-6 provide a list of the various Operations and Maintenance (O&M) projects proposed for Nellis AFB that are the more likely projects to be funded and executed over the next few years and are Restoration and Modernization projects, and Sustainment projects respectively.

The following tables list all of the CIP projects currently on the BCAMP for Nellis AFB. The project number is broken down by base, year and project identifier number. RKMF denotes Nellis, the first two numbers are the program year, and the last four are the identifier number. For example, project number RKMF 06-3002, Consolidated Security Forces, RKMF is on Nellis AFB and programmed for FY 2006 with the unique identifier 3002.

| <b>Table 2-3. Current Mission MILCON Projects</b> |   |                            |
|---|---|----------------------------|
| <b>Project Number</b>                             | <b>Project Title</b>                              | <b>Infrastructure Type</b> |
| RKMF 03-3010                                      | Sound Suppressor Support Facility                 | Airfield                   |
| RKMF 03-3302                                      | Replace Dormitories 725, 727, & 729 (AT/FP)       | Facility                   |
| RKMF 03-3901                                      | Aircraft Explosives Cargo Parking Area            | Airfield                   |
| RKMF 05-3003                                      | Maintenance Facility (F-16)                       | Facility                   |
| RKMF 05-3004                                      | Multi-Purpose Maintenance Facility (Replace B283) | Facility                   |
| RKMF 06-3002                                      | Consolidated Security Forces                      | Security                   |
| RKMF 06-3004                                      | Red Flag Facility                                 | Facility                   |
| RKMF 06-3010                                      | F/A-22 Munitions Support Facilities               | Facility                   |
| RKMF 09-3020                                      | ECIP-HVAC Thermal Storage Ice Plant               | Facility                   |

|              |  |          |
|--------------|--|----------|
| RKMF 10-3003 | Communications Networks Control Center               | Facility |
| RKMF 10-3004 | Add/Alter Green Flag Facility                        | Facility |
| RKMF 10-3801 | Relocate Transformers and Switchgear                 | Utility  |
| RKMF 11-3001 | TYPE III Hydrant Fueling System                      | Airfield |
| RKMF 11-3002 | F-16 Aggressor Airfield Pavements                    | Airfield |
| RKMF 11-3004 | Communication Support Center (Replace B295)          | Facility |
| RKMF 11-3005 | ADD RPA Weapons School Facility                      | Facility |
| RKMF 11-3006 | ADD/ALTER HH-60 General Purpose Maintenance Facility | Facility |
| RKMF 11-3010 | Community Fire Station                               | Facility |
| RKMF 11-3011 | AIRBORNE RED HORSE Flight Covered Storage Facility   | Facility |
| RKMF 11-3012 | AIRBORNE RED HORSE Flight Operations Facility        | Facility |
| RKMF 11-3025 | Area Development Plan                                | Facility |
| RKMF 03-3901 | Aircraft Explosives Cargo Parking Area               | Airfield |
| RKMF 12-3004 | Adversary Tactics Analysis Center                    | Facility |
| RKMF 12-3005 | 57 IAS Mission Operations Facility                   | Facility |
| RKMF 12-3009 | HH-60 RECAP Operational Flight Trainer Facility      | Facility |
| RKMF 12-3010 | Dormitory  | Facility |
| RKMF 14-3004 | Fire Station, Area III                               | Facility |
| RKMF 14-3005 | Fire Station, Area II                                | Facility |
| RKMF 14-3006 | JTAC Simulator Facility                              | Facility |

*Note:* Table acronyms listed in Appendix A

| <b>Table A-4. Representative F-35A MILCON Construction Projects</b> |  |                            |
|---|--|----------------------------|
| <b>Project Number</b>   | <b>Project Title</b>                           | <b>Infrastructure Type</b> |
| RKMF 10-3005  | F-35 Alternate Mission Equipment (AME) Storage | Facility                   |
| RKMF 10-3006  | F-35 Parts Store                               | Facility                   |
| RKMF 10-3009  | F-35 Fuel Cell Hangar                          | Facility                   |
| RKMF 10-3011  | F-35A Munitions Maintenance Facilities         | Facility                   |
| RKMF 10-3012  | F-35A Weapons Load Training Facility           | Facility                   |
| RKMF 12-3007  | F-35A Weapons School Facility                  | Facility                   |
| RKMF 14-3001  | F-35A Maintenance Hangar/AMU                   | Facility                   |
| RKMF 14-3002  | F-35A Live Ordnance Loading Area               | FacilityAirfield           |
| RKMF 14-3003  | F-35A Airfield Pavements                       | Airfield                   |

*Note:* Table acronyms listed in Appendix A

| <b>Table A-5. Restoration/Modernization Construction/Repair Projects</b> |   |                            |
|--|---|----------------------------|
| <b>Project Number</b>  | <b>Project Title</b>  | <b>Infrastructure Type</b> |
| RKMF 08-0013A  | Repair Fire Suppression System, Hangar 290, (F-16 MX)           | Utility                    |
| RKMF 98-0029   | Repair Fire Suppression System, Hangars 222, 224, & 226         | Utility                    |
| RKMF 14-0138   | Repair Interior Consolidated Support Facility (Bldg 20) Phase 1 | Facility                   |
| RKMF 12-0059   | Construct Shoulder Additions Aloha and Echo EORs                | Airfield                   |
| RKMF 11-0127   | Construct South Water Main to East Side (RED HORSE)             | Utility                    |
| RKMF 12-0051   | Repair Lighting, Buildings 262, 245, 61660, and 270             | Utility                    |
| RKMF 10-0072   | Repair Interior Legal Office, Building 18                       | Facility                   |
| RKMF 13-0125   | Repair Building 2364 or TACAN and Demolish Facility 2060        | Facility                   |
| RKMF 13-0089   | Repair/Reconfigure Dormitory 782 (IAW DMP)                      | Facility                   |
| RKMF 09-0131   | Relocate PAPI's on Taxiway Delta                                | Utility                    |
| RKMF 12-0126   | Taxiway Lights, N. LOLA Pad/Taxiway H/J                         | Airfield                   |

|               |   |          |
|---------------|---|----------|
| RKMF 12-0039  | Repair Drainage Culvert Taxiway Alpha                               | Airfield |
| RKMF 11-0096  | Construct Flightline Fence  | Security |
| RKMF 13-0054  | Install FOD Cap at Runway 03R                                       | Airfield |
| RKMF 12-0003  | Repair Well #4, and Install Security Enhancements, Craig Rd         | Security |
| RKMF 10-0095  | Construct AVB, Beale Ave  | Security |
| RKMF 12-0106  | Seal all Cracks/Spall on Shoulders of Taxiways and Aprons           | Airfield |
| RKMF 11-0102  | Repair 19 WPS Vault/Mission Planning Cell, Bldg 282                 | Facility |
| RKMF 14-0050  | Construct/Repair Parking Lots, Bldgs 2101, 425, and 2345            | Road     |
| RKMF 14-0139  | Repair Interior Consolidated Support Facility (Bldg 20) Phase 2     | Facility |
| RKMF 14-0140  | Repair Interior Consolidated Support Facility (Bldg 20) Phase 3     | Facility |
| RKMF 08-0016  | Construct Storage Facility, Red Flag                                | Facility |
| RKMF 08-0017  | Construct Admin/Training Facility, Red Flag                         | Facility |
| RKMF 12-0127  | Repair HVAC Building 297 Support Section (Viper)                    | ECIP     |
| RKMF 12-0054  | Repair Ventilation System, Tech Shop, Building 252                  | Facility |
| RKMF 12-0063  | Repair Door Track Support Beam, Hangar 61664                        | Hangar   |
| RKMF 12-0123A | F-35A Addition FTD Building 586                                     | Facility |
| RKMF 12-0123B | Repair Interior F-35A FTD Building 586                              | Facility |
| RKMF 11-0076  | Life Support Supply Facility (RED HORSE)                            | Facility |
| RKMF 12-0122  | Area III Fire Station (RED HORSE)                                   | Facility |
| RKMF 13-0037  | AGE Storage Pads, Revetments  | Airfield |
| RKMF 12-0118  | Alternate Primary Feeder, Hospital, Building 1300                   | Utility  |
| RKMF 10-0109  | Repair F-35A Munitions Trailer Maintenance Facility, Building 10305 | Facility |
| RKMF 05-0088  | Ellsworth Road Realignment (RED HORSE)                              | Road     |
| RKMF 10-0088  | Construct (Replace) LOX Facility                                    | Facility |
| RKMF 13-0601  | Airfield Obstruction Survey   | Airfield |
| RKMF 09-0090  | Repair Partitions, Conference Center, Building 554                  | Facility |
| RKMF 11-0117  | Repair Information Transfer Node, Building 878                      | Utility  |
| RKMF 12-0093  | Install High Security Hasps Multiple Facilities MSA                 | Security |
| RKMF 11-0134  | Repair F-35A Weapon s Standardization Section, Hangar 283           | Facility |
| RKMF 12-0127  | Repair HVAC Building 297 Support Section (Viper)                    | ECIP     |
| RKMF 12-0003  | Repair Well #4, and Install Security Enhancements, Craig Rd         | Security |
| RKMF 10-0092  | Repair Pavements, North Gate  | Road     |
| RKMF 10-0096  | Construct Passive Barriers, North Gate                              | Security |
| RKMF 10-0100  | Construct Traffic Circle, North Gate                                | Road     |
| RKMF 10-0099  | Construct AVB, Ellsworth Ave  | Security |

**Table A-6. Representative Sustainment Construction/Repair Projects**

| <b>Project Number</b> | <b>Project Title</b>  | <b>Infrastructure Type</b> |
|-----------------------|---|----------------------------|
| RKMF 12-0087          | Repair Fire Detection & Alarm Sys. Main Exchange, B431                                | Utility                    |
| RKMF 10-0019          | Repair Roofs: Red Flag, Hangar 290, Desert Oasis, T-bird                              | Facility                   |
| RKMF 10-0101          | Repair HVAC, Bldg 282   | ECIP                       |
| RKMF 13-0126          | Repair HV Switches, Main Base   | Utility                    |
| RKMF 01-0067          | Repair Roof, Bldg 625   | Facility                   |
| RKMF 13-0130          | Repair HVAC Network Control Center, BLDG 47   | Facility                   |
| RKMF 13-0129          | Repair Drainage Facilities 415, 447, 448, and 2097                                    | Facility                   |
| RKMF 10-0004          | Repair Water Tanks and Coat Interiors   | Utility                    |
| RKMF 09-0002          | Repair Water System, Area II  | Utility                    |
| RKMF 08-0035          | Repair HVAC, Red Flag Building 201  | ECIP                       |
| RKMF 13-0128          | Repair Multiple Roofs, Bldgs 47, 470, 66, 102, 118, 122, 250, 282, 284, 286, 415, 256 | Facility                   |



|              |   |          |
|--------------|---|----------|
| RKMF 11-0123 | Maintain Interior Carpeting/Paint, Dorms 792/794, Dayrooms 783/793/795                            | Facility |
| RKMF 08-0036 | Repair Overhead Switch with Pad Mounted Unit, Area II   | Utility  |
| RKMF 08-6100 | Repair Drinking Water Main Dead-Ends, Tyndall Ave   | Utility  |
| RKMF 12-0027 | Repair HVAC, Building 1114  | ECIP     |
| RKMF 10-0149 | Repair Pavements, Runway 03R/21L  | Airfield |
| RKMF 06-6125 | Install Backflow Prevention Devices Various Facilities  | Utility  |
| RKMF 06-0124 | Repair Intersections Washington Blvd  | Road     |
| RKMF 10-0105 | Repair Pavements, Fuel Barn   | Airfield |
| RKMF 09-6957 | Repair UST Auto Tank Gauging System   | Utility  |
| RKMF 05-0033 | Install Fire Suppression Sys. CES Readiness Building 10136  | Utility  |
| RKMF 08-0085 | Repair Fire Suppression System, Dining Hall, Building 567   | Utility  |
| RKMF 07-6911 | Construct Transformer Containment Pad, Building 1043  | Utility  |
| RKMF 07-0087 | Install Grounding Points, Main Parking Apron  | Airfield |
| RKMF 12-0128 | Repair Joint Seals Main Parking Apron   | Airfield |
| RKMF 15-0010 | Repair Hangar Doors, Corrosion Control (Building 256)   | Facility |
| RKMF 03-0142 | Repair Grounding System Control Tower, Building 2064  | Utility  |
| RKMF 08-0071 | Repair HVAC, Base Operations Building 805   | ECIP     |
| RKMF 08-0089 | Install Fire Suppression Control Tower, Building 2064   | Utility  |
| RKMF 12-0129 | Repair Boiler Corrosion Control Facility 256  | Utility  |
| RKMF 08-0014 | Repair Parking Lot for Aggressor Hangar/AMU   | Road     |
| RKMF 08-0001 | Repair Inoperable Fire Alarm Systems, Various Facilities: MPF, USAFWC, Weapons School, Hangar 283 | Utility  |
| RKMF 08-0093 | Repair Gas Lines Area III (near TLFs)   | Utility  |
| RKMF 14-0029 | Repair Shoulder Pavements Fighter Revets & Bomber LOLA  | Airfield |
| RKMF 01-0067 | Repair Roof, Building 625 (old hospital)  | Facility |
| RKMF 09-0039 | Repair CNG Service Station  | Facility |
| RKMF 08-0100 | Repair Area III Waterline (near Building 1154)  | Utility  |
| RKMF 14-0027 | Maintain Paint Transformer Boxes, Airfield  | Utility  |
| RKMF 10-0104 | Repair Pavements, T West South Apron  | Airfield |

Previously mentioned CIP projects for Restoration, Modernization, and Sustainment only make up a fraction of all of the CIP projects in ACES. Although those projects have a higher priority, there are numerous miscellaneous construction, repair, installation and maintenance projects that also fall under the funding category for Operations and Maintenance. Table A-7 lists all of the O&M CIP projects in the ACES list regardless of the category.

| <b>Table A-7. O&amp;M Construction Projects</b> |   |                            |
|---|---|----------------------------|
| <b>Project Number</b>                           | <b>Project Title</b>                      | <b>Infrastructure Type</b> |
| RKMF080029                                      | Add/ Repair PMEL Bldg 425                 | Facility                   |
| RKMF010112                                      | Add/Alter Honor Guard Facility            | Facility                   |
| RKMF130601                                      | Airfield Obstruction Survey               | N/A - Survey/Study         |
| RKMF040213                                      | Alter Interior Bldg 1300 Federal Hospital | Facility                   |
| RKMF010102                                      | Alter Interior Wall Bldg 625              | Facility                   |
| RKMF020146                                      | Alter Jet Engine Shop, Bldg 858           | Facility                   |
| RKMF140009                                      | Alter Office To Vault, Bldg 102           | Facility                   |
| RKMF960041                                      | Alter Tyndall Gate Approach Lane          | Roads/parking lots         |

|             |  |                    |
|-------------|--|--------------------|
| RKMF970042  | Alter WSs Annex Bldg 118   | Facility           |
| RKMF070017  | BRAC-Construct WRM & Mobility Bag Storage Facility                         | Facility           |
| RKMF010124  | Construct 66 RQS Parking Lot   | Roads/parking lots |
| RKMF060070  | Construct ABM/UBM Storage Facility   | Facility           |
| RKMF100095  | Construct Active Vehicle Barrier, Beale Ave (AT/FP)                        | Security           |
| RKMF010053A | Construct Addition Taxiway B Lola  | Airfield           |
| RKMF040168  | Construct Additional Parking Bldg 425                                      | Roads/parking lots |
| RKMF070026  | Construct Addn Age Facility  | Facility           |
| RKMF990027B | Construct Addn Fire Station B-277  | Facility           |
| RKMF020012A | Construct Addn FTD Bldg 586  | Facility           |
| RKMF950110  | Construct Addn LANTIRN Facility  | Facility           |
| RKMF070037  | Construct Addn, AGE Sub-Pool, Bldg 285                                     | Facility           |
| RKMF130037  | Construct AGE Equipment Storage Pads At Revetments                         | Facility           |
| RKMF060009  | Construct Airborne RH Storage Facility                                     | Facility           |
| RKMF950021  | Construct Airfield Crash Yard  | Facility           |
| RKMF080031  | Construct Airfield Signage At Taxiway E And DOE Ramp                       | Airfield           |
| RKMF120118  | Construct Alternate Primary Feeder, MOFH Bldg 1300                         | Roads/parking lots |
| RKMF150017  | Construct Angled Yellow & Black Stripe Painting, Vehicle Maintenance Shops | Roads/parking lots |
| RKMF060049  | Construct Area II Running Track  | Recreation         |
| RKMF120122  | Construct Area III Fire Station  | Facility           |
| RKMF190003  | Construct Asphalt Apron Addn, Bldgs 10155 & 10157                          | Airfield           |
| RKMF040155  | Construct Awning Bldg 61694  | Facility           |
| RKMF060027  | Construct BAK 12 Barrier Rwy 03R/21L North                                 | Airfield           |
| RKMF060027B | Construct BAK Pavement   | Airfield           |
| RKMF020034  | Construct BAK-12 Aircraft Arresting Barrier, Runway 03L/21R                | Airfield           |
| RKMF006102  | Construct Base Car Wash  | Facility           |
| RKMF165051  | Construct Bulk Fuel Operations And Personnel Building                      | Facility           |
| RKMF020005  | Construct Catm Range Lighting  | Utility            |
| RKMF170004  | Construct Cement Pad And Extend Parking Lot Next To Bldg 1107              | Roads/parking lots |
| RKMF040159  | Construct Chapel Elevator Bldg 615   | Facility           |
| RKMF050044B | Construct Classroom Addition Readiness Bldg 10146                          | Facility           |
| RKMF070012  | Construct Comm Switch Facility   | Utility            |
| RKMF060081  | Construct Concrete Pad 57 EMS  | Facility           |
| RKMF990009  | Construct Consolidated Maintain Fac (Bd)                                   | Facility           |
| RKMF090040  | Construct Covered Storage Area, Area II                                    | Facility           |
| RKMF090080  | Construct CSAR CTF Storage Facility  | Facility           |
| RKMF050088  | Construct Ellsworth Ave Realignment (AT/FP)                                | Security           |
| RKMF140004  | Construct Explosive Pad, Munitions Storage Area                            | Facility           |
| RKMF050060  | Construct External Patrol Route WSA  | Security           |
| RKMF060154  | Construct F-15 Model Base Bldg 201   | Facility           |

|             |  |                    |
|-------------|--|--------------------|
| RKMF040174  | Construct F-86 Pedestal                                      | Facility           |
| RKMF110096  | Construct Flightline Fence                                   | Utility            |
| RKMF120045  | Construct Flightline Fence (Frangible Zone)                  | Utility            |
| RKMF960088  | Construct Flightline Kitchen                                 | Facility           |
| RKMF070097  | Construct GA Compound Fence Bd                               | Facility           |
| RKMF070107  | Construct GA Compound Warehouse Bd                           | Facility           |
| RKMF070108  | Construct GA Water Trainer Bd                                | Facility           |
| RKMF140021  | Construct Garage, Bldg 292                                   | Facility           |
| RKMF070043  | Construct Generator Catwalk, Bldg 202                        | Facility           |
| RKMF140032  | Construct Information Transfer Node Facility Bldg 10214      | Facility           |
| RKMF010025B | Construct Kinley Drive Extension                             | Roads/parking lots |
| RKMF140005  | Construct Kitchen In Common Area, Dorm 794                   | Facility           |
| RKMF110076  | Construct Life Support Facility, 66 RQG/563 RQG              | Facility           |
| RKMF100088  | Construct LOX Facility                                       | Facility           |
| RKMF984005  | Construct MFH Multipurpose Court                             | Recreation         |
| RKMF000025  | Construct Military Clothing Sales                            | Facility           |
| RKMF060011  | Construct Mobility & Training Facility                       | Facility           |
| RKMF020002  | Construct O/H CATM Canopy                                    | Facility           |
| RKMF150008  | Construct Offices With Viewing Windows, Hangar 270           | Facility           |
| RKMF050103  | Construct Parking Lot Bldg 10210                             | Roads/parking lots |
| RKMF060148  | Construct Parking Lot Bldg 1301                              | Roads/parking lots |
| RKMF060031  | Construct Parking Lot Bldg 588                               | Roads/parking lots |
| RKMF010121  | Construct Parking Lot Bldg 625                               | Roads/parking lots |
| RKMF010093A | Construct Parking Lot F-22 Facilities                        | Roads/parking lots |
| RKMF100096  | Construct Passive Vehicle Barriers, North Gate (AT/FP)       | Security           |
| RKMF060050  | Construct Patio Enclosure                                    | Recreation         |
| RKMF140044  | Construct PJ Multi-Purpose Training Tower Facility           | Facility           |
| RKMF050047  | Construct Rec Facility Dorms 794, 786, 782, & 792            | Recreation         |
| RKMF080017  | Construct Red Flag CSAR Admin Facility (Bd)                  | Facility           |
| RKMF070003  | Construct Redhorse Sunshades                                 | Facility           |
| RKMF070002  | Construct Retaining Wall/Pave VM Backlot                     | Roads/parking lots |
| RKMF000091  | Construct Rickenbacker Rd                                    | Roads/parking lots |
| RKMF990005  | Construct RS Ops/Maintain Facility                           | Facility           |
| RKMF080076  | Construct Security Enhancements, Craig Rd Wells              | Security           |
| RKMF030171  | Construct SF Warehouse Area 3                                | Facility           |
| RKMF160008  | Construct Shade Cover Over Liquid Watch LCD Unit, Bldg 62120 | Facility           |
| RKMF020126  | Construct Sidewalk Kinley Ave                                | Roads/parking lots |
| RKMF040196  | Construct Sidewalks Area III                                 | Roads/parking lots |
| RKMF070024  | Construct Soccer Field Parking Lot                           | Roads/parking lots |
| RKMF110155  | Construct Solar Lighting At Hospital Track                   | Recreation         |
| RKMF110156  | Construct Solar Lighting At PT Test Track                    | Recreation         |

|              |   |                    |
|--------------|---|--------------------|
| RKMF140039   | Construct Solar Lighting, Golf Course PT Track              | Recreation         |
| RKMF110127   | Construct South Water Main To East Side                     | Utility            |
| RKMF200004   | Construct Static Display Lighting, Freedom Park             | Utility            |
| RKMF080016   | Construct Storage Facility, Red Flag Bd                     | Facility           |
| RKMF110157   | Construct Stretching/Sit-Up Station At Hospital Track       | Recreation         |
| RKMF060023   | Construct Sun Shade Main Gate 99 SFS Bldg 698               | Facility           |
| RKMF060107   | Construct Sunshade North Gate                               | Facility           |
| RKMF060108   | Construct Sunshade Tyndall Gate                             | Facility           |
| RKMF075001   | Construct Support Utilities, Golf Course Clubhouse          | Recreation         |
| RKMF970071   | Construct Taxiway Bomber LOLA Pad                           | Airfield           |
| RKMF100100   | Construct Traffic Circle, North Gate (AT/FP)                | Roads/parking lots |
| RKMF070018   | Construct Trim Pad  | Airfield           |
| RKMF140030   | Construct Two Aggregate Wash Ponds                          | Facility           |
| RKMF200003   | Construct Two Helicopter Parking Spots (66 RQS)             | Airfield           |
| RKMF040176   | Construct Vaults Bldg 100                                   | Facility           |
| RKMF016108   | Correct Cross-Connections                                   | Utility            |
| RKMF016108AA | Correct Cross-Connections                                   | Utility            |
| RKMF046101   | Correct Loop Main Base                                      | Utility            |
| RKMF110107   | Demolish Bldg 10213, Unoccupied Prison Camp Chapel          | Facility           |
| RKMF110108   | Demolish Bldg 10214, Unoccupied Prison Camp Facility        | Facility           |
| RKMF120121   | Demolish Bldg 601   | Facility           |
| RKMF050025   | Demolish Bldg 841 Base Cold Storage                         | Facility           |
| RKMF120034A  | Demolish Bldgs 433, 434, 436, 438 & Part Of Bldg 432        | Facility           |
| RKMF120062A  | Demolish Bldgs 867 & 899                                    | Facility           |
| RKMF180004   | Demolish Building 10208                                     | Facility           |
| RKMF070027   | Demolish Dorm 725   | Facility           |
| RKMF0601111  | Demolish Fuel Yard Facilities                               | Facility           |
| RKMF950064   | Demolish Steam Plant, Building 10207                        | Facility           |
| RKMF160015   | Demolish Tennis Courts At Officers' Club                    | Recreation         |
| RKMF100013   | Demolish/Replace Bldg 459                                   | Facility           |
| RKMF046101D  | Design, Correct Loop Main Base                              | Utility            |
| RKMF150003   | Extend Antenna Pad, Bldg 202                                | Facility           |
| RKMF100099   | Install Active Vehicle Barriers, Ellsworth Ave (AT/FP)      | Security           |
| RKMF671093   | Install Additional Filtration For Fac 267 JP-8 Dispenser    | Utility            |
| RKMF140017   | Install Addn Of Fire Sprinkler System, Bldg 294             | Utility            |
| RKMF070069   | Install Advanced Elect, Gas, Water Meters, Various Fac      | Utility            |
| RKMF016116   | Install APIMS   | Utility            |
| RKMF960064   | Install Awning & Lighting B 199                             | Facility           |
| RKMF090106   | Install Backup Generator, Bldg 811                          | Facility           |
| RKMF060024   | Install BAK 12 Remove BAK 9 Runway 03R/21L North End 99 CES | Airfield           |
| RKMF090015   | Install BSERV Power, EOD                                    | Utility            |

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| RKMF970022   | Install CATM Range Utilities                                   | Utility  |
| RKMF150007   | Install Comm Conduits, Bldg 540                                | Utility  |
| RKMF120061   | Install Cooking Hood & Vent System, Bldg 556                   | Facility |
| RKMF000042   | Install Covers Revetments                                      | Facility |
| RKMF130702   | Install Energy Controller Multi Fac                            | Energy   |
| RKMF160007   | Install Fence, Gates And Signs, Nellis Small Arms Ranges       | Security |
| RKMF970084   | Install Fire Alarm Panels Various Facilities                   | Utility  |
| RKMF050033   | Install Fire Suppression System, Bldg 10136                    | Utility  |
| RKMF090102   | Install Fire Suppression System, Kitchen Area, Dorm 783        | Utility  |
| RKMF006104   | Install Fuel Flow Meters, JP-8                                 | Utility  |
| RKMF006104AA | Install Fuel Flow Meters, JP-8                                 | Utility  |
| RKMF030032   | Install Gates Flightline                                       | Security |
| RKMF070087   | Install Grounding Points Main Apron                            | Airfield |
| RKMF140042   | Install High Security Rolling Vehicle Gates, Various Locations | Security |
| RKMF066108   | Install Hourly Meters  | Utility  |
| RKMF190006   | Install HVAC System, Bldg 1040                                 | Utility  |
| RKMF120088   | Install Isolation Valve and Valve Vault, Eastside Revetment    | Utility  |
| RKMF050018   | Install Landscaping CTF B-470                                  | Facility |
| RKMF972011   | Install Lightning Protection Sys, MSA Pads                     | Utility  |
| RKMF090105   | Install Monaco D 21 Mgmt System, Bldg 2                        | Facility |
| RKMF060120   | Install Motion Activated Light Switches                        | Energy   |
| RKMF966900   | Install MW, Fuel Dispensing AR                                 | Utility  |
| RKMF960080   | Install Natural Gas Lines Area II                              | Utility  |
| RKMF040160   | Install NOC Backup A/C Unit Bldg 201                           | Utility  |
| RKMF170001   | Install One Additional Toilet, Bldg451                         | Facility |
| RKMF040133   | Install Overhead Lighting Bldg 194                             | Facility |
| RKMF050017   | Install Paint Booth Air Compressor Bldg 253                    | Facility |
| RKMF140041   | Install Pedestrian Full Height Turnstiles, Various Locations   | Security |
| RKMF960079   | Install Perimeter Rd Lighting MSA                              | Utility  |
| RKMF150019   | Install Permanent Shower/Eyewash Stations, Bldg 1053           | Facility |
| RKMF980032   | Install R/W Approach Lighting Sys                              | Airfield |
| RKMF020136   | Install Roll-Up Door Bldg 10305                                | Facility |
| RKMF970031   | Install Security Barriers F/L                                  | Security |
| RKMF090103   | Install Security Bollards, BX                                  | Security |
| RKMF070099   | Install Security Enhancements Nellis Perimeter Fence           | Security |
| RKMF990012   | Install Security Sys Bldg 200                                  | Security |
| RKMF046110   | Install Sewer Connections                                      | Utility  |
| RKMF140157   | Install Shade Structure and Bollards, Military Service Station | Facility |
| RKMF140014   | Install Sink And Static Free Carpet, Bldg 61690                | Facility |
| RKMF020152   | Install Sink Bldg 423  | Facility |
| RKMF930081   | Install Sprinkler System Bldg 470                              | Facility |

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| RKMF016114  | Install Tank Gauge, Fac2814                                  | Facility |
| RKMF050143  | Install Test Cell Pad  | Facility |
| RKMF120126  | Install Txwy Lights At N. Lola Pad/Txwy & Hotel/Jolly Txwys  | Airfield |
| RKMF060032  | Install Warning Signal                                       | Utility  |
| RKMF040170  | Install Water Chiller Bldg 270                               | Facility |
| RKMF170007  | Install Water Contaminant Monitor Sys (Area II)              | Utility  |
| RKMF170008  | Install Water Contaminant Monitor Sys (Area III & Main Base) | Utility  |
| RKMF970083  | Install Wet Pipe Systems And Alarm Systems, Bldgs 836 & 838  | Utility  |
| RKMF040172  | Install Windows Bldg 100                                     | Energy   |
| RKMF010055  | Maintain Airfield Pavements                                  | Airfield |
| RKMF020035  | Maintain Airfield Pavements                                  | Airfield |
| RKMF020083  | Maintain Airfield Pavements                                  | Airfield |
| RKMF060074  | Maintain Airfield Pavements                                  | Airfield |
| RKMF080027  | Maintain Airfield Pavements                                  | Airfield |
| RKMF090016  | Maintain Airfield Pavements                                  | Airfield |
| RKMF140035  | Maintain Airfield Pavements                                  | Airfield |
| RKMF150026  | Maintain Airfield Pavements                                  | Airfield |
| RKMF160014  | Maintain Airfield Pavements                                  | Airfield |
| RKMF170009  | Maintain Airfield Pavements                                  | Airfield |
| RKMF180005  | Maintain Airfield Pavements                                  | Airfield |
| RKMF190004  | Maintain Airfield Pavements                                  | Airfield |
| RKMF200002  | Maintain Airfield Pavements                                  | Airfield |
| RKMF050059  | Maintain Clear Terrain WSA                                   | Facility |
| RKMF010101  | Maintain CRU Floor B10406                                    | Facility |
| RKMF010119  | Maintain CRU Floor Thunderbird Hangar                        | Facility |
| RKMF040166  | Maintain CRU Flooring Bldg 858                               | Facility |
| RKMF000121  | Maintain CRU Floors B-10402/10406                            | Facility |
| RKMF150011  | Maintain Cryogenic Tank Paint, Bldg 195                      | Facility |
| RKMF970123  | Maintain ECT Various Facilities IDIQ                         | Utility  |
| RKMF970100  | Maintain Exterior Walls Manch Manor *140                     | Facility |
| RKMF040180  | Maintain Exterior Bldg 1042                                  | Facility |
| RKMF990064X | Maintain Exterior Bldg 20                                    | Facility |
| RKMF140036  | Maintain Exterior Paint, Various Facilities                  | Facility |
| RKMF150028  | Maintain Exterior Paint, Various Facilities                  | Facility |
| RKMF140026  | Maintain Exterior Wall Paint, Bldg 790                       | Facility |
| RKMF050120  | Maintain Exterior Walls                                      | Facility |
| RKMF980065  | Maintain Exterior Walls Nellis Terrace 192                   | Facility |
| RKMF010125  | Maintain Exterior Walls Thunderbird Hangar                   | Facility |
| RKMF040181  | Maintain Exterior Water Towers                               | Facility |
| RKMF140012  | Maintain Floor And Wall Paint, Bldg 1100                     | Facility |
| RKMF170002  | Maintain Hangar Floor Surface, Bldg 285                      | Facility |

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| RKMF150013  | Maintain Hangar Signs Paint, Bldg 61664                             | Facility           |
| RKMF140015  | Maintain Interior Paint Of Propulsion Flight, Bldg 858              | Facility           |
| RKMF140037  | Maintain Interior Paint, Various Facilities                         | Facility           |
| RKMF150029  | Maintain Interior Paint, Various Facilities                         | Facility           |
| RKMF150014  | Maintain Interior Wall Paint, Bldg 285                              | Facility           |
| RKMF050142  | Maintain Interior Walls CDC Bldg 601                                | Facility           |
| RKMF050139  | Maintain Landscaping RANW Hq Bldg 200                               | Facility           |
| RKMF0501296 | Maintain Landscaping Var Facilities                                 | Facility           |
| RKMF050138  | Maintain Landscaping, Various Facilities                            | Facility           |
| RKMF986009  | Maintain Office Equipment   | Facility           |
| RKMF140025  | Maintain Parking Line Paint, Bldg 1105                              | Roads/parking lots |
| RKMF070085  | Maintain Parking Lot Bldg 201                                       | Roads/parking lots |
| RKMF970008  | Maintain Roads Manch II   | Roads/parking lots |
| RKMF150021  | Maintain Traffic Arrow Paint, Bldgs 831 & 832                       | Roads/parking lots |
| RKMF150027  | Maintain Various Airfield Shoulders                                 | Airfield           |
| RKMF200001  | Maintain Various Airfield Shoulders                                 | Airfield           |
| RKMF140013  | Maintain Vehicle Bay Paint, Bldg 1028                               | Airfield           |
| RKMF070088  | Maintain Warning Signs Airfield                                     | Airfield           |
| RKMF140027  | Paint Runway Obstacles  | Airfield           |
| RKMF066106  | Pave Haul Road  | Roads/parking lots |
| RKMF090131  | Relocate Rwy 21R PAPI Lights  | Airfield           |
| RKMF150030  | Relocate Street Light At RV Park                                    | Utility            |
| RKMF090087  | Renovate 2nd Floor, Bldg 585  | Facility           |
| RKMF140019  | Renovate Bathrooms, Bldg 292  | Facility           |
| RKMF150024  | Renovate Bathrooms, Bldg 807  | Facility           |
| RKMF150015  | Renovate Briefing & Debriefing Rooms, Bldg 250                      | Facility           |
| RKMF140034  | Renovate Classrooms 1 & 2, Bldg 312                                 | Facility           |
| RKMF160012  | Renovate Classrooms 1 & 2, Bldg 312                                 | Facility           |
| RKMF160010  | Renovate Current Lounge, Bldg 324                                   | Facility           |
| RKMF160009  | Renovate Interior Of Bldg 10413                                     | Facility           |
| RKMF180001  | Renovate Kitchen, Chapel Basement 615                               | Facility           |
| RKMF140010  | Renovate Offices, Repair Concrete, And Upgr Security Lock, Bldg 200 | Facility           |
| RKMF180002  | Renovate Pol Maintenance, Bldg 857                                  | Facility           |
| RKMF140020  | Renovate Weather Grates, Bldg 292                                   | Facility           |
| RKMF130090  | Renovate/Reconfigure Dorm 786 (Iaw DMP)                             | Facility           |
| RKMF130091  | Renovate/Reconfigure Dorm 792 (Iaw DMP)                             | Facility           |
| RKMF130092  | Renovate/Reconfigure Dorm 794 (Iaw DMP)                             | Facility           |
| RKMF066128  | Repair 90-Day Site Facility   | Facility           |
| RKMF070046  | Repair AFFF Tank F-22A Hangar 285                                   | Utility            |
| RKMF070083  | Repair Air Handlers Bldg 201  | Facility           |
| RKMF050034  | Repair Air Intakes Bldg 1300 Federal Hospital                       | Facility           |

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| RKMF000087   | Repair Aircraft Arresting Barrier                          | Airfield           |
| RKMF990039   | Repair Aircraft Parts Store B-811                          | Facility           |
| RKMF930144   | Repair Airfield Access Road                                | Roads/parking lots |
| RKMF120039   | Repair Airfield Drainage Headwall                          | Airfield           |
| RKMF980063   | Repair Airfield Infield                                    | Airfield           |
| RKMF040020   | Repair Airfield Lighting Circuit Cables                    | Airfield           |
| RKMF050147   | Repair Airfield Lighting Handholes                         | Airfield           |
| RKMF120059   | Repair Alpha And Echo EOR Asphalt Shoulders                | Airfield           |
| RKMF080100   | Repair Area III Water Line, Hospital Drive                 | Utility            |
| RKMF160013   | Repair Asphalt Pavement Runway 03L/21R (Mill/Overlay)      | Airfield           |
| RKMF000064B  | Repair Asphalt Pavements, Fuel Cell, B199                  | Facility           |
| RKMF140028   | Repair Asphalt Shoulder, Hot Cargo Pad                     | Facility           |
| RKMF130132   | Repair ASTs (multiple locations)                           | Utility            |
| RKMF016123   | Repair ATG & Comm Line                                     | Utility            |
| RKMF016123AA | Repair ATG & Comm Line                                     | Utility            |
| RKMF090114   | Repair Base Ops DV Lounge, Bldg 805                        | Facility           |
| RKMF980009   | Repair Base Perimeter Road                                 | Roads/parking lots |
| RKMF070105   | Repair Base SCADA Water System                             | Utility            |
| RKMF076464   | Repair Base SCADA Water System                             | Utility            |
| RKMF000031   | Repair Base Supply Bldg 811                                | Facility           |
| RKMF000031C  | Repair Base Supply Pavements                               | Roads/parking lots |
| RKMF090121   | Repair Basement To SCIF, Bldg 620                          | Facility           |
| RKMF060136   | Repair Bathroom Bldg 258                                   | Facility           |
| RKMF970028   | Repair Bathrooms Dorm 334                                  | Facility           |
| RKMF970029   | Repair Bathrooms Dorm 336                                  | Facility           |
| RKMF070094   | Repair Bldg 10202, 58 RQS Bd                               | Facility           |
| RKMF090072   | Repair Bldg 10234 For Kennel Conversion                    | Facility           |
| RKMF170100   | Repair Bldg 2074   | Facility           |
| RKMF120062B  | Repair Bldg 336  | Facility           |
| RKMF050035   | Repair Boiler Plant Bldg 1300 Federal Hospital             | Facility           |
| RKMF120129   | Repair Boiler, Corrosion Control Bldg 256                  | Facility           |
| RKMF090096   | Repair Broken Bathroom Door Frames & Doors, Dorm 727 & 729 | Facility           |
| RKMF066934   | Repair Bulk Ground Product Storage, Nellis AFB             | Facility           |
| RKMF170101   | Repair BX  | Facility           |
| RKMF080026   | Repair Cable Runs, Airfield Lighting Cables                | Utility            |
| RKMF960025   | Repair MPF Bldg 20   | Facility           |
| RKMF150020   | Repair Ceiling Height In Aircraft Training Rooms, Bldg 453 | Facility           |
| RKMF080078   | Repair Chillers, Network Control Center, Bldg 589          | Facility           |
| RKMF090039   | Repair CNG Service Station                                 | Facility           |
| RKMF060013   | Repair Community Center                                    | Facility           |
| RKMF986110   | Repair Components, 4 Tanks                                 | Facility           |



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| RKMF140023  | Repair Concrete Pads, Bldgs 10418 & 11145                  | Facility           |
| RKMF060036  | Repair Conference Room O'Club Bldg 554                     | Facility           |
| RKMF000111  | Repair Crash Rescue Trng Fac                               | Facility           |
| RKMF080083  | Repair Crosswinds Dining Hall Serving Line Power, Bldg 790 | Facility           |
| RKMF060062  | Repair CRU Floors Bldg 415                                 | Facility           |
| RKMF046260  | Repair Distillation Unit                                   | Facility           |
| RKMF150012  | Repair Divider Walls, TLF Area                             | Facility           |
| RKMF140022  | Repair Door And Handicap Accesses, Bldg 445                | Facility           |
| RKMF120063  | Repair Door Track Support Beam, Hangar 61664               | Facility           |
| RKMF120093  | Repair Doors, Hasps & Vents, Multi MSA Facilities          | Facility           |
| RKMF040202  | Repair Dorm Bollard Lighting                               | Facility           |
| RKMF120041  | Repair Dormitory Bathrooms, Bldg 727                       | Facility           |
| RKMF120040  | Repair Dormitory Bathrooms, Bldg 729                       | Facility           |
| RKMF040112B | Repair Drainage Hangar 61664                               | Facility           |
| RKMF080179  | Repair Drainage Swing Gates                                | Facility           |
| RKMF170012  | Repair Drainage, Bldg 858                                  | Facility           |
| RKMF086100  | Repair Drinking Water Main Dead-Ends On Tyndall            | Utility            |
| RKMF140038  | Repair Drinking Water Storage Tank #562                    | Utility            |
| RKMF066118  | Repair Drinking Water System                               | Utility            |
| RKMF066119  | Repair Drinking Water System, Area 2                       | Utility            |
| RKMF016109  | Repair DW System   | Utility            |
| RKMF070011  | Repair E&E/Egress Bldg 260                                 | Facility           |
| RKMF060012  | Repair Electrical Bldg 415                                 | Utility            |
| RKMF080073  | Repair Electrical Distribution System, Red Flag            | Utility            |
| RKMF160017  | Repair Electrical Service, Desert Eagle RV Park            | Utility            |
| RKMF090082  | Repair Electrical/HVAC MTC, Bldg 205                       | Utility            |
| RKMF070029  | Repair EOC Bldg 620  | Facility           |
| RKMF070104  | Repair Exec Offices Bldg 620                               | Facility           |
| RKMF120054  | Repair Exhaust Ventilation System, Bldg 252                | Facility           |
| RKMF150004  | Repair Exterior Brick Walls, Bldg 602                      | Facility           |
| RKMF070111  | Repair Exterior Coating Various Facilities                 | Facility           |
| RKMF070036  | Repair F-22 AMU Bldg 285                                   | Facility           |
| RKMF070036B | Repair F-22 AMU, Bldg 285                                  | Facility           |
| RKMF100109  | Repair F-35A MUNS Trailer Maint Fac, Bldg 10305            | Facility           |
| RKMF110134  | Repair F-35A Weapons Standardization Section, Bldg 283     | Facility           |
| RKMF070010  | Repair Fenced Transformers With Padmounts                  | Facility           |
| RKMF140033  | Repair Fenceline And Gates (MSA)                           | Facility           |
| RKMF070030C | Repair Fencing & Landscaping Tyndall & Range Rd Gates      | Facility           |
| RKMF070030  | Repair Fencing And Pavement Range Rd Gate (Fence)          | Roads/parking lots |
| RKMF070030B | Repair Fencing And Pavement Range Rd Gate (Paving)         | Roads/parking lots |
| RKMF050010  | Repair Fillstand Pavements                                 | Airfield           |

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| RKMF060069  | Repair Fire Alarm System Warrior Inn                          | Utility            |
| RKMF090097  | Repair Fire Alarm System, Dorms 727, 729, 782, 786, 792 & 794 | Utility            |
| RKMF080001  | Repair Fire Alarm Systems, Various Facilities                 | Utility            |
| RKMF160003  | Repair Fire Alarms System, Bldg 10302                         | Utility            |
| RKMF160002  | Repair Fire Alarms System, Bldg 10305                         | Utility            |
| RKMF160005  | Repair Fire Alarms System, Bldg 10309                         | Utility            |
| RKMF090064  | Repair Fire Alarms System, Bldg 20                            | Utility            |
| RKMF140001  | Repair Fire Alarms System, Bldg 812                           | Utility            |
| RKMF970084A | Repair Fire Alarms System, Bldgs 10302 & 10305                | Utility            |
| RKMF120087  | Repair Fire Detection & Alarm System, Main Exchange Bldg 431  | Utility            |
| RKMF160001  | Repair Fire Suppression And Alarms System, Bldg 595           | Utility            |
| RKMF080089  | Repair Fire Suppress & Alarm Systems, Control Tower Bldg 2064 | Utility            |
| RKMF980029  | Repair Fire Suppress System, Bldg 222, 224 & 226              | Utility            |
| RKMF990008  | Repair Fire Suppression System And Alarm, Hangar 239          | Utility            |
| RKMF000021  | Repair Fire Suppression System Bldg 200                       | Utility            |
| RKMF160004  | Repair Fire Suppression System, Bldg 11                       | Utility            |
| RKMF080070  | Repair Fire Suppression System, Bldg 253                      | Utility            |
| RKMF080013A | Repair Fire Suppression System, Hangar 290                    | Utility            |
| RKMF080085  | Repair Fire Suppression System, Mt View Dining Hall, Bldg 567 | Utility            |
| RKMF070049  | Repair Fire Suppression System, Various Facilities            | Utility            |
| RKMF010131  | Repair Fitzgerald/Washington Intersection                     | Roads/parking lots |
| RKMF050145  | Repair Floor Bldg 882   | Facility           |
| RKMF970106  | Repair Floors Dorms 786, 792, & 794                           | Facility           |
| RKMF090070  | Repair FTI & Data Lab, Bldg 423                               | Facility           |
| RKMF000064  | Repair Fuel Cell Bldg 199                                     | Facility           |
| RKMF040161  | Repair Garage Door Bldg 220                                   | Facility           |
| RKMF000091B | Repair Gas Line Rickenbacker Rd                               | Utility            |
| RKMF140006  | Repair Grade Terrain In Approach North 21L, Nellis Airfield   | Airfield           |
| RKMF070072  | Repair Grease Trap Bldg 600                                   |                    |
| RKMF040048  | Repair Grease Traps Bldg 567                                  |                    |
| RKMF066101  | Repair Ground Water Treatment                                 | Facility           |
| RKMF030142  | Repair Grounding Sys Control Tower                            | Facility           |
| RKMF030093  | Repair Gym Locker Rooms, Bldg 432                             | Facility           |
| RKMF090088  | Repair Handicap Access Areas, Bldg 588                        |                    |
| RKMF050110  | Repair Hangar 237 Vault B1                                    | Facility           |
| RKMF080039  | Repair Hangar Door Frame, Bldg 232                            | Facility           |
| RKMF180003  | Repair Hangar Door Operation Switches, Bldg 61664             | Facility           |
| RKMF040162  | Repair Hangar Doors Bldg 292                                  | Facility           |
| RKMF150010  | Repair Hangar Doors, Hangar 256                               | Facility           |

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| RKMF150016  | Repair Hangar Floor Paint, Bldg 252                             | Facility   |
| RKMF140003  | Repair Hangar Lighting System, Bldg 283                         | Facility   |
| RKMF970135  | Repair Health & Wellness Ctr B625                               | Recreation |
| RKMF070009  | Repair H-Frame Transformers With Padmounts                      | Facility   |
| RKMF080028  | Repair HIX Foam System, Hangar 283                              | Facility   |
| RKMF010007  | Repair Hush House Pull Test                                     | Facility   |
| RKMF980052  | Repair HVAC AGE Fac Bldg 415                                    | ECIP       |
| RKMF980050  | Repair HVAC Base Chapel   | ECIP       |
| RKMF120127  | Repair HVAC Bldg 297 Support Section (Viper)                    | ECIP       |
| RKMF030133  | Repair HVAC Comm Rm Bldg 620                                    | ECIP       |
| RKMF980118  | Repair HVAC Dining Hall 567                                     | ECIP       |
| RKMF970072  | Repair HVAC Hangar 270  | ECIP       |
| RKMF980106  | Repair HVAC Manch III *180                                      | ECIP       |
| RKMF960007  | Repair HVAC Manch III *20                                       | ECIP       |
| RKMF170010  | Repair HVAC Piping In Multiple Rooms, Dorm 727                  | ECIP       |
| RKMF980051  | Repair HVAC Red Flag Bldg 201                                   | ECIP       |
| RKMF980041  | Repair HVAC Red Forces  | ECIP       |
| RKMF980049  | Repair HVAC Support Facility Bldg 625                           | ECIP       |
| RKMF120027  | Repair HVAC System, Bldg 1114                                   | ECIP       |
| RKMF980094  | Repair HVAC Time Out Sports Lounge                              | ECIP       |
| RKMF061012  | Repair HVAC Various Facilities                                  | ECIP       |
| RKMF080071  | Repair HVAC, Base Ops Bldg 805                                  | ECIP       |
| RKMF080035  | Repair HVAC, Red Flag Bldg 201                                  | ECIP       |
| RKMF940020B | Repair Hydrants And Valves Area I                               | Utility    |
| RKMF080148  | Repair Interior & HVAC, Bldg 415 Bd                             | Facility   |
| RKMF040203  | Repair Interior Airman Center Bldg 775                          | Facility   |
| RKMF080019  | Repair Interior And Fire Suppression, Bldg 232 Bd               | Facility   |
| RKMF050019  | Repair Interior Bldg 270 Phase Hangar                           | Facility   |
| RKMF040128  | Repair Interior Bldg 334 & 336                                  | Facility   |
| RKMF070101  | Repair Interior Bldgs 194 & 199                                 | Facility   |
| RKMF110123  | Repair Interior Carpet & Paint, Dorms 783, 792, 793, 794, & 795 | Facility   |
| RKMF060128  | Repair Interior Control Tower Bldg 2064                         | Facility   |
| RKMF110122  | Repair Interior Electrical System, Dorms 782, 786, 792, 794     | Facility   |
| RKMF060138  | Repair Interior Nellis Federal Hospital                         | Facility   |
| RKMF980098  | Repair Interior VOQ Bldg 538                                    | Facility   |
| RKMF070033  | Repair Interior Weapons School Bldg 282                         | Facility   |
| RKMF080032  | Repair Interior, Bldg 20  | Facility   |
| RKMF080025  | Repair Interior, Bldg 61663                                     | Facility   |
| RKMF060098  | Repair Interior, Hangar 220 Bd                                  | Facility   |
| RKMF100072  | Repair Interior, Legal Office Bldg 18                           | Facility   |
| RKMF090054  | Repair Interior, Threat Tng Fac, Bldg 470                       | Facility   |

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| RKMF050074  | Repair Interior/Exterior 57 MOS Bldg 2102         | Facility           |
| RKMF060034  | Repair Intersections Various Roads                | Roads/parking lots |
| RKMF046180  | Repair Issue & Receipt Filter Separator, Fac 1050 | Facility           |
| RKMF090045  | Repair Joint Seal, Main Apron South               | Airfield           |
| RKMF150025  | Repair Joint Seals Main Apron                     | Airfield           |
| RKMF120128  | Repair Joint Seals, Main Parking Apron            | Airfield           |
| RKMF010025A | Repair Kinley Drive                               | Roads/parking lots |
| RKMF980089  | Repair Kinley Drive MFH                           | Roads/parking lots |
| RKMF930043  | Repair Kitchen Cabinets VOQs                      | Facility           |
| RKMF070042  | Repair Landscape Irrigation System, Bldg 45       | Facility           |
| RKMF100089  | Repair Lox Facility Pavements, Bldg 459           | Roads/parking lots |
| RKMF060003  | Repair Main Apron                                 | Airfield           |
| RKMF990027A | Repair Main Fire Station Bldg 277                 | Facility           |
| RKMF970104  | Repair Manch Roads                                | Roads/parking lots |
| RKMF050031  | Repair Marshalling Yard, 99 LRS                   | Roads/parking lots |
| RKMF070022  | Repair Medical Dental Clinic                      | Facility           |
| RKMF070035  | Repair MOC Bldg 328                               | Facility           |
| RKMF980039  | Repair NATCF Bldg 200                             | Facility           |
| RKMF000054  | Repair North Airfield Infield                     | Airfield           |
| RKMF150032  | Repair O'Club Roof, Bldg 554                      | Facility           |
| RKMF060075  | Repair Offices, Bldgs 61685 & 61690               | Facility           |
| RKMF080014  | Repair Parking Lot Aggressor Bd                   | Roads/parking lots |
| RKMF050150  | Repair Parking Lot Bldg 340                       | Roads/parking lots |
| RKMF060152  | Repair Parking Lot Bldg 98                        | Roads/parking lots |
| RKMF150033  | Repair Parking Lot Drainage, Bldg 861             | Roads/parking lots |
| RKMF190007  | Repair Parking Lot Lighting, Bldg 2349            | Roads/parking lots |
| RKMF020012B | Repair Parking Lot TD Bldg 586                    | Roads/parking lots |
| RKMF190001  | Repair Parking Lot, Bldg 589                      | Roads/parking lots |
| RKMF090090  | Repair Partitions O'Club, Bldg 554                | Facility           |
| RKMF930010  | Repair Pavement 3rd & 4th St MSA                  | Roads/parking lots |
| RKMF060022  | Repair Pavement Tyndall Ave 99 CES                | Roads/parking lots |
| RKMF040163  | Repair Pavements CTF Bldg 470                     | Roads/parking lots |
| RKMF060124  | Repair Pavements Various Intersections            | Roads/parking lots |
| RKMF960062  | Repair Pavements Various Roads                    | Roads/parking lots |
| RKMF100105  | Repair Pavements, Fuel Barn                       | Roads/parking lots |
| RKMF100092  | Repair Pavements, North Gate (AT/FP)              | Roads/parking lots |
| RKMF100103  | Repair Pavements, Runway 03L/21R & Overruns       | Airfield           |
| RKMF100104  | Repair Pavements, T West South Apron              | Airfield           |
| RKMF970043  | Repair Photo Lab Bldg 625                         | Facility           |
| RKMF090095  | Repair Plumbing Dorm 706                          | Facility           |
| RKMF990011  | Repair PMEL Lab Bldg 425                          | Facility           |

|             |   |                    |
|-------------|---|--------------------|
| RKMF970047  | Repair POL Parking Lot                                | Roads/parking lots |
| RKMF050044A | Repair Readiness Bldg 10146                           | Facility           |
| RKMF960011  | Repair Receipt/Off-Load Pumphouse                     | Facility           |
| RKMF070001  | Repair Redhorse Compound Pavements                    | Roads/parking lots |
| RKMF040199  | Repair Restrooms B-100                                | Facility           |
| RKMF040169  | Repair Restrooms Bldg 258                             | Facility           |
| RKMF040171  | Repair Restrooms Bldg 877                             | Facility           |
| RKMF070102  | Repair Restrooms Dorms 782, 786, 792, 794             | Facility           |
| RKMF070102C | Repair Restrooms, Dorm 792                            | Facility           |
| RKMF010105  | Repair Restrooms, FTD Facility, B586                  | Facility           |
| RKMF110117  | Repair Rm 104 For Information Transfer Node, Bldg 878 | Facility           |
| RKMF080033  | Repair Roof And Bball Court Floor, Fitness Center     | Recreation         |
| RKMF060004  | Repair Roof Area II Gymnasium                         | Recreation         |
| RKMF060005  | Repair Roof Base Operations Facilities                | Facility           |
| RKMF050002  | Repair Roof BE Maint Shop Bldg 4792                   | Facility           |
| RKMF070008  | Repair Roof Bldg 102                                  | Facility           |
| RKMF040175  | Repair Roof Bldg 201                                  | Facility           |
| RKMF980008A | Repair Roof Bldg 224                                  | Facility           |
| RKMF010046  | Repair Roof Bldg 586                                  | Facility           |
| RKMF050008  | Repair Roof Comm Facility                             | Facility           |
| RKMF050005  | Repair Roof HQ 57 MXG Bldg 328                        | Facility           |
| RKMF970013  | Repair Roof Maint Hangar 245                          | Facility           |
| RKMF090083  | Repair Roof Thunderbird Hangar 292                    | Facility           |
| RKMF070075  | Repair Roof, Bldg 102                                 | Facility           |
| RKMF070073  | Repair Roof, Bldg 10304                               | Facility           |
| RKMF170011  | Repair Roof, Bldg 124                                 | Facility           |
| RKMF070076  | Repair Roof, Bldg 428                                 | Facility           |
| RKMF160016  | Repair Roof, Bldg 454                                 | Facility           |
| RKMF070050  | Repair Roof, Bldg 4792                                | Facility           |
| RKMF040156  | Repair Roof, Bldg 610                                 | Facility           |
| RKMF010067  | Repair Roof, Bldg 625                                 | Facility           |
| RKMF060006  | Repair Roof, Dorm 715                                 | Facility           |
| RKMF060007  | Repair Roof, Dorm 745                                 | Facility           |
| RKMF090049  | Repair Roof, Hangar 262                               | Facility           |
| RKMF150031  | Repair Roof, Hangar 290                               | Facility           |
| RKMF970086  | Repair Roofs Bldgs 18 & 780                           | Facility           |
| RKMF970101  | Repair Roofs Manch III                                | Facility           |
| RKMF980112  | Repair Roofs On Dorms 715 & 725                       | Facility           |
| RKMF980111  | Repair Roofs Various Dorms                            | Facility           |
| RKMF100019  | Repair Roofs, Various Facilities                      | Facility           |
| RKMF200005  | Repair Room 40 Vault, Red Flag Bldg 201               | Facility           |

|             |   |                    |
|-------------|---|--------------------|
| RKMF980012  | Repair Runway 03L/21R                                   | Airfield           |
| RKMF100149  | Repair Runway 03L/21R Pavements/Overruns                | Airfield           |
| RKMF890021  | Repair Runway 21R/3L Lighting Sys                       | Airfield           |
| RKMF080052B | Repair SCIF and Fire System, Bldg 215                   | Facility           |
| RKMF070109  | Repair Sewer Lines                                      | Utility            |
| RKMF060064  | Repair Sewer Lines Area II (Phase II)                   | Utility            |
| RKMF020028  | Repair Sewer Pumping Stations                           | Utility            |
| RKMF140029  | Repair Shoulder Pavements, Fighter Revets & Bomber LOLA | Airfield           |
| RKMF980010  | Repair Shoulders R/W 03R/021L                           | Airfield           |
| RKMF070064  | Repair Sidewalk, Bldg 620                               | Roads/parking lots |
| RKMF955002B | Repair Skills Development Cent                          | Recreation         |
|             |   |                    |
|             |   |                    |
| RKMF980008  | Repair Storm Damage Var Roofs                           | Facility           |
| RKMF960059  | Repair Street Lights Manch I & II                       | Utility            |
| RKMF962029  | Repair Stucco, Dunning Circle                           | Facility           |
| RKMF040167  | Repair Survival Equip Shop Ceiling & Roof, Bldg 124     | Facility           |
| RKMF060082  | Repair SVS Admin Bldg 336                               | Facility           |
| RKMF950032  | Repair Taxiway B  | Airfield           |
| RKMF010053B | Repair Taxiway B Lighting LOLA                          | Airfield           |
| RKMF010053  | Repair Taxiway B LOLA                                   | Airfield           |
| RKMF060043  | Repair Taxiway F  | Airfield           |
| RKMF980135  | Repair Telex Bldg 6                                     | Facility           |
| RKMF080093  | Repair TLF Gas Lines, Area III                          | Utility            |
| RKMF000065  | Repair Training Detachment Fac B-586                    | Facility           |
| RKMF940024  | Repair VAQ Bldg 536                                     | Facility           |
| RKMF070013A | Repair Various Facilities 58 RQS                        | Facility           |
| RKMF070013  | Repair Various Facilities 58 RQS Bd                     | Facility           |
| RKMF980136  | Repair Various Pavements MFH                            | Roads/parking lots |
| RKMF060141  | Repair Visiting Quarters, Bldg 538                      | Facility           |
| RKMF060142  | Repair Visiting Quarters, Bldg 540                      | Facility           |
| RKMF060151B | Repair Washrack Facility 271                            | Facility           |
| RKMF950042  | Repair Water Line Loop WSA                              | Utility            |
| RKMF070106  | Repair Water Lines                                      | Utility            |
| RKMF050013  | Repair Water Main Well 7                                | Utility            |
| RKMF980138  | Repair Water Pump Station                               | Utility            |
| RKMF940020  | Repair Water System Hydrants And Valves                 | Utility            |
| RKMF090002  | Repair Water System, Area II                            | Utility            |
| RKMF970092  | Repair Water Tank Stand Pipe MFH                        | Utility            |
| RKMF980028  | Repair Water Tanks                                      | Utility            |
| RKMF100004  | Repair Water Tanks And Coat Interiors                   | Utility            |

|            |  |            |
|------------|--|------------|
| RKMF140002 | Repair Water Well #2, Bldg 1024                          | Utility    |
| RKMF120003 | Repair Water Well #4 & Security Enhancements (Fac 1026)  | Utility    |
| RKMF150001 | Repair Water Well #7, Bldg 489                           | Utility    |
| RKMF070016 | Repair Weapons Load Trainer Hangar 283                   | Facility   |
| RKMF970040 | Repair Weapons School Annex B 102                        | Facility   |
| RKMF970041 | Repair Weapons School Bldg 284                           | Facility   |
| RKMF339356 | Repair Well 2 (RHS)                                      | Utility    |
| RKMF046106 | Repair Wells, Area II                                    | Utility    |
| RKMF070034 | Repair Wheel/Tire/AR Bldg 270                            | Facility   |
| RKMF040177 | Repair Women's Restroom Bldg 100                         | Facility   |
| RKMF000005 | Repair WSA Sensor System                                 | Facility   |
| RKMF130089 | Repair/Reconfigure Dorm 782 (IAW DMP)                    | Facility   |
| RKMF130084 | Repair/Upgrade Dorm 706 (IAW DMP)                        | Facility   |
| RKMF130085 | Repair/Upgrade Dorm 715 (IAW DMP)                        | Facility   |
| RKMF130086 | Repair/Upgrade Dorm 745 (IAW DMP)                        | Facility   |
| RKMF130087 | Repair/Upgrade Dorm 767 (IAWDMP)                         | Facility   |
| RKMF130088 | Repair/Upgrade Dorm 777 (IAW DMP)                        | Facility   |
| RKMF86102  | Replace Cast Iron Water Main On Tyndall Ave              | Utility    |
| RKMF140008 | Replace CRU Flooring, Bldg 61664                         | Facility   |
| RKMF140018 | Replace Fire Alarm Panel, Bldg 265                       | Facility   |
| RKMF140031 | Replace Fire Alarm System, Bldg 616 (Chapel Annex)       | Utility    |
| RKMF090052 | Replace Fire Suppression And Alarm Systems, Bldg 10278   | Utility    |
| RKMF056130 | Replace Halon Suppression System                         | Utility    |
| RKMF080036 | Replace Overhead HV Switch With Pad Mounted Unit Area II | Facility   |
| RKMF140016 | Replace Pool Piping, Base Swimming Pool                  | Recreation |
| RKMF150009 | Replace Roof On Equipment Room, Bldg 870                 | Recreation |
| RKMF080177 | Replace Roof, Bldg 858                                   | Facility   |
| RKMF150006 | Replace Sewer Line, Fitzgerald To Tyndall                | Utility    |
| RKMF060083 | Replace Well #2  | Utility    |
| RKMF140011 | Replace/Repair Roof Support Beam, Bldg 890               | Facility   |
| RKMF150002 | Upgrade Electrical Power and Equipment, Bldg 442         | Utility    |
| RKMF150018 | Upgrade Entrance Doors, Hangar 245                       | Facility   |
| RKMF150005 | Upgrade Fire Alarms System, Bldg 10301                   | Utility    |
| RKMF140007 | Upgrade Fire Alarms System, Bldg 807                     | Utility    |
| RKMF990006 | Upgrade Fire Suppression & Alarm Systems, Bldg 270       | Utility    |
| RKMF140024 | Upgrade Fire Suppression System, Bldg 262                | Utility    |
| RKMF160006 | Upgrade Motor Control Center, Wells 11, 12 & 14          | ECIP       |
| RKMF076212 | Upgrade Parts Washer                                     | Facility   |
| RKMF170003 | Upgrade Room 132, Bldg 1100                              | Facility   |

## **ACRONYMS USED**

A/C—Air Conditioning  
AFFF—Aqueous Fire Fighting Foam  
AGE—Aerospace Ground equipment IAS  
AMU—Aircraft Maintenance Unit  
APIMS—Air Permit Information Management System  
AT/FP—Antiterrorism Force Protection  
ATG—Adversary Tactics Group  
AVB - Active Vehicle Barrier  
BAK—Barrier Arresting Kit  
BCAMP—Base Comprehensive Asset Management Plan  
BSERV—Bomb Squad Emergency Response Vehicle  
BX—Base Exchange  
CATM—Combat Arms Training and Maintenance  
CDC—Child Development Center  
CNG—Compressed Natural Gas  
CRU—Chemically Resistant Urethane  
CSAR—Combat Search and Rescue  
CTF—Conference Training Facility  
DMP—Design Master Plan  
DOE—Department of Energy  
DV—Distinguished Visitor  
ECIP –Energy Conservation Improvement Program  
E&E—Emergency and Evacuation  
EMS—Equipment Maintenance Shop  
EOC—Emergency Operations Center  
EOD—Explosive Ordnance Disposal  
EOR—End of Runway  
FDE—Force Development Evaluation  
F/L--Flightline  
FTD—Flight Training Device  
FTI—Flight Test Instrumentation  
HV—Heating and Ventilation  
HVAC—Heating, Ventilation, and Air Conditioning  
IAS—Information Aggressor Squadron  
IAW—In Accordance With  
IPL—Integrated Priorities List  
JSF—Joint Strike Fighter  
JTAC –Joint Tactical Air Controller  
LANTIRN—Low-Altitude Navigation & Targeting Infrared for Night  
LCD—Liquid Crystal Display  
LEED—Leadership in Energy and Environmental Design  
LOLA—Live Ordnance Loading Area  
LOX—Liquid Oxygen  
MFH—Military Family Housing  
MOFH—Michael O’Callaghan Federal Hospital  
MOS—Maintenance Operations Squadron  
MPF—Military Personnel Flight  
MSA—Munitions Storage Area  
MUNS—Munitions Squadron



MX—Maintenance  
MXG—Maintenance Group  
NATCF—Nellis Air Traffic Control Facility  
NOC—Network Operations Center  
O/H—Overhead  
PAPI—Precision Approach Path Indicator  
PMEL—Precision Measuring Equipment Laboratory  
POL—Petroleum, Oil, and Lubricants  
PT—Physical Training  
RANW—Range Wing  
RHS—RED HORSE Squadron  
RS—Reconnaissance Squadron  
RV—Recreational Vehicle  
R/W—Runway  
SCIF—Sensitive/Secure Compartmentalized Information Facility  
SVS—Services Squadron  
TLF—Temporary Lodging Facility  
TWXY—Taxiway  
USAFWC—United States Air Force Warfare Center  
UST—Underground Storage Tank  
VAQ—Visiting Airmen’s Quarters  
VM—Vehicle Maintenance  
VOQ—Visiting Officers’ Quarters  
WS—Weapons School  
WSA—Weapons Storage Area

## **APPENDIX B**

### **AIR QUALITY ANALYSIS**

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## APPENDIX B

### AIR QUALITY ANALYSIS

#### Air Quality Standards

As described in Section 3.8, Air Quality in a given location is described by the concentration of various pollutants in the atmosphere. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. These standards (Table B-1) represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. The Nevada Division of Environmental Protection, Bureau of Air Pollution Control has adopted the NAAQS, with the exceptions of an additional 8-hour CO standard specific to elevations greater than 5,000 feet above mean seal level and a 1-hour standard for hydrogen sulfide (H<sub>2</sub>S). The state ambient air quality standards are summarized in Table B-1 along with the Federal standards.

Because Nellis AFB has not determined the exact projects to be undertaken, the order in which they would occur, or when they would occur, the exact emissions from any given project during any year is impossible to calculate. Therefore, a more programmatic approach has been developed to identify the amount of land disturbance that could occur at Nellis AFB during one year before *de minimis* levels would be reached. To determine the amount of construction and demolition activities generating emissions that would meet the *de minimis* thresholds, the following factors were considered: contributions from engine exhaust emissions (i.e., construction equipment, material handling, and transportation), fugitive dust emissions (e.g., from digging and grading activities) and emissions from vehicles needed for transport of demolition debris offsite.

Emissions from construction worker personally owned vehicles (POVs) have also been included in the total calculated emissions. The following worksheets were developed to estimate emissions from two scenarios:

Scenario 1: demolition of 1 acre of land, including materials associated with the demolition of a 2,000 square foot, 2-story concrete building, debris removal, and site preparation; the construction portion of this scenario involved site disturbance of 3 acres to include construction of a 30,000 square-foot concrete maintenance shop with a 100,000 square-foot parking area; and

Scenario 2: combined demolition and construction acreage was increased to 13, and the sizes of the buildings and parking lots to be demolished and constructed were tripled from those used in Scenario 1.

The emissions factors and assumptions are provided in the following worksheets. In conclusion, Nellis AFB will use this worksheet to estimate the potential emissions from projects at the base during a given year in order to remain below *de minimis* levels.

**Table B-1 State and National Ambient Air Quality Standards**

|   | <i>Nevada Standards</i> |  | <i>National Standards</i> |                      |
|---|-------------------------|--|---------------------------|----------------------|
|   | AVERAGING TIME          | CONCENTRATION                          | PRIMARY                   | SECONDARY            |
| Ozone   | 1 Hour                  | 0.12 ppm<br>(235 µg/m <sup>3</sup> )   | None                      | None                 |
| Ozone   | 8 Hours                 | None                                   | 0.075 ppm                 | Same as Primary      |
| Carbon Monoxide less than 5,000 ft above MSL          | 8 Hours                 | 9.0 ppm<br>(10,500 µg/m <sup>3</sup> ) | 9.0 ppm                   | None                 |
| Carbon Monoxide at or greater than 5,000 ft above MSL | 8 Hours                 | 6.0 ppm<br>(7,000 µg/m <sup>3</sup> )  | 9.0 ppm                   |                      |
| Carbon Monoxide at any elevation                      | 1 Hour                  | 35 ppm<br>(40,500 µg/m <sup>3</sup> )  | 35 ppm                    |                      |
| Nitrogen Dioxide                                      | 1 Hour                  | None                                   | 100 ppb                   | None                 |
| Nitrogen Dioxide                                      | Annual Mean             | 0.053 ppm<br>(100 µg/m <sup>3</sup> )  | 53 ppb                    | Same as Primary      |
| Sulfur Dioxide  | 1 Hour                  | 0.03 ppm<br>(80 µg/m <sup>3</sup> )    | 75 ppb                    | None                 |
|   | 3 Hour                  | 0.14 ppm<br>(365 µg/m <sup>3</sup> )   |                           | 0.5 ppm              |
|   | Annual Arithmetic Mean  | 50 µg/m <sup>3</sup>                   | None                      | None                 |
| Particulate Matter as PM <sub>10</sub>                | 24 Hours                | 150 µg/m <sup>3</sup>                  | 150 µg/m <sup>3</sup>     | Same as Primary      |
| <sup>1</sup> Particulate Matter as PM <sub>2.5</sub>  | Annual                  | None                                   | 12 µg/m <sup>3</sup>      | 15 µg/m <sup>3</sup> |
|   | 24 Hours                | None                                   | 35 µg/m <sup>3</sup>      | Same as Primary      |
| Lead (Pb)   | Rolling 3 month average | 1.5 µg/m <sup>3</sup>                  | 0.15 µg/m <sup>3</sup>    | Same as Primary      |
| <sup>2</sup> Hydrogen Sulfide (H <sub>2</sub> S)      | 1 Hour                  | 0.08 ppm<br>(112 µg/m <sup>3</sup> )   |                           |                      |

Notes:

(a) µg/m<sup>3</sup> means micrograms per cubic meter.

(b) ppm means part per million by volume.

<sup>1</sup>Published December 14, 2012. EPA anticipates making initial attainment/nonattainment designations by December 2014, with those designations likely becoming effective in early 2015.

<sup>2</sup> The ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.

Sources:

Nevada Division of Environmental Protection, 2010. Accessed at <http://ndep.nv.gov/baqp/monitoring/aaqstd.html>

USEPA, 2012. Accessed at <http://www.epa.gov/air/criteria.html>



# Department of Air Quality & Environmental Management

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Alan Pinkerton, Deputy Director • Lewis Wallenmeyer, Acting Director

February 12, 2008

Bruce W. MacDonald, P.E.  
Department of the Air Force  
Headquarters Air Combat Command  
Langley AFB VA, 23665

Re: F-35 Beddown at Nellis AFB

Dear Mr. MacDonald:

The Clark County Department of Air Quality and Environmental Management (DAQEM) is in receipt of your letter dated January 16, 2008 with regard to Headquarters Air Combat Command's request that our agency include nitrogen oxide (NO<sub>x</sub>) emissions from the planned F-35 Beddown at Nellis AFB in the Ozone State Implementation Plan for Clark County.

Before Air Force staff met with DAQEM regarding this request, DAQEM had already completed the ozone modeling analysis for the nonattainment area in Clark County, which includes the majority of Nellis AFB. Emissions from the proposed F-35 Beddown were therefore not included in that analysis. After reviewing the proposed emissions detailed in the letter of request, DAQEM is confident that the emissions can be incorporated in the SIP.

The ozone modeling was extensive, and at this time DAQEM is not intending to remodel. DAQEM is, however, committed to incorporating discussion of the emissions from the Nellis expansion and explain how such emissions would have little impact on the nonattainment area. DAQEM believes this should be satisfactory to EPA. If EPA requests a formal modeling reanalysis, DAQEM would accommodate that request.

It is important to note, however, that EPA is scheduled to promulgate a new ozone standard in March 2008, and issue reclassifications of the current 8-hour ozone standard in 2009. DAQEM does not know at this time how those actions may impact the County's attainment demonstration. DAQEM staff is meeting with EPA Region 9 later this month to discuss these issues, but it is anticipated that only preliminary information will be obtained.

DAQEM is committed to working with the Air Force as is within the agency's means and within EPA direction. DAQEM will contact and coordinate with your staff if concerns arise.

Please contact me if you have any questions.

Sincerely,

Stephen Deyo  
Assistant Planning Manager, DAQEM

cc: Sheryl K. Parker, Langley AFB  
Shimi Mathew, Nellis AFB  
Dennis Ransel, DAQEM

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**TAB A. CONSTRUCTION EMISSIONS - SCENARIO 1**  
**Small/Medium Demolition and Construction Effort, Nellis Air Force Base**

**Basic Conversions**  
453.59 grams per pound  
43,560 Conversion from Acre to SF  
0.03704 Cubic feet to Cubic Yards  
0.1111 Square Feet to Square Yards  
1.4 tons/CY for Gravel  
80,000 lbs/Truck Load for Delivery  
1.66 CY for each CY of asphalt/concrete demo  
0.333333333 asphalt thickness for demolition  
0.333333333 asphalt thickness for pavement  
2000 pounds per ton  
145 lb/ft<sup>3</sup> density of Hot Mix Asphalt

**Table 1. Building Demolition - 2013**

2,000 SF                      100 Estimated CY of debris based on 20 SF/CY

| Off-road Equipment                                    | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|---|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|-----------|-----------|-----------|------------|-------------|-----------------------|
| Hydraulic excavator with breakers and jackhammer bits | 17                            | 86        | 0.59                                  | 0.45                        | 3.84                       | 4.70                        | 0.13                                    | 0.45                         | 0.43                          | 594.79                                  | 0.84      | 7.16      | 8.76      | 0.24      | 0.83       | 0.81        | 1,109                 |
| Wheel Loader w/ integral Backhoe                      | 17                            | 87        | 0.23                                  | 1.43                        | 7.35                       | 6.35                        | 0.15                                    | 1.06                         | 1.03                          | 691.66                                  | 1.05      | 5.40      | 4.67      | 0.11      | 0.78       | 0.76        | 509                   |
| Wheel mounted air compressor                          | 17                            | 49        | 0.43                                  | 0.33                        | 2.54                       | 4.53                        | 0.13                                    | 0.54                         | 0.53                          | 595.16                                  | 0.25      | 1.97      | 3.51      | 0.10      | 0.42       | 0.41        | 461                   |
| On-road Equipment                                     | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (12 CY Capacity)                           | 9                             | 230       | 27                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 0.41      | 2.14      | 9.81      | 0.00      | 0.42       | 0.41        | 846                   |
| <b>Subtotal (lbs):</b>                                |                               |           |                                       |                             |                            |                             |   |                              |                               |   | <b>3</b>  | <b>17</b> | <b>27</b> | <b>0</b>  | <b>2</b>   | <b>2</b>    | <b>2,924</b>          |

**Table 2. Demo Asphalt/Concrete- 2013**

50,000 SF                      1,025 CY

| Off-road Equipment   | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb  | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|--|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|-----------|------------|-----------|------------|-------------|-----------------------|
| D-6K Crawler Dozer with attachments  | 121                           | 125       | 0.58                                  | 0.34                        | 1.21                       | 4.08                        | 0.12                                    | 0.23                         | 0.22                          | 536                                     | 6.65      | 23.34     | 78.89      | 2.23      | 4.37       | 4.24        | 10,359                |
| Wheel mounted air compressor   | 121                           | 49        | 0.59                                  | 0.33                        | 2.54                       | 4.53                        | 0.13                                    | 0.54                         | 0.53                          | 595                                     | 2.53      | 19.59     | 34.90      | 0.99      | 4.18       | 4.05        | 4,588                 |
| Pneumatic Paving Breaker and jackhammer on excavator (CAT 345D L or similar) | 42                            | 380       | 0.59                                  | 0.31                        | 2.50                       | 4.51                        | 0.13                                    | 0.55                         | 0.54                          | 595                                     | 6.43      | 51.42     | 92.82      | 2.64      | 11.37      | 11.03       | 12,258                |
| On-road Equipment  | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb  | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck   | 94                            | 230       | 27                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 4.25      | 21.98     | 100.48     | 0.05      | 4.33       | 4.21        | 8,666                 |
| <b>Subtotal (lbs):</b>   |                               |           |                                       |                             |                            |                             |   |                              |                               |   | <b>20</b> | <b>94</b> | <b>207</b> | <b>6</b>  | <b>20</b>  | <b>19</b>   | <b>27,206</b>         |

**Table 3. Site Prep for Building Construction - 2013**

Grading (SY)                      30,000 SF                      Convert                      3,333 SY                      Assume compact 0.5 feet (0.166 yards)                      556 CY compacted

| Off-road Equipment          | Cumulative Hours of Operation <sup>1</sup> | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|-----------------------------|--|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|-----------|-----------|-----------|------------|-------------|-----------------------|
| Excavator                   | 0  | 243       | 0.59                                  | 0.34                        | 1.21                       | 4.03                        | 0.12                                    | 0.22                         | 0.22                          | 535.79                                  | 0.00      | 0.00      | 0.00      | 0.00      | 0.00       | 0.00        | 0                     |
| Skid Steer Loader           | 0  | 160       | 0.23                                  | 0.38                        | 1.47                       | 4.34                        | 0.12                                    | 0.31                         | 0.30                          | 535.67                                  | 0.00      | 0.00      | 0.00      | 0.00      | 0.00       | 0.00        | 0                     |
| Grader                      | 25   | 285       | 0.58                                  | 0.34                        | 1.21                       | 4.07                        | 0.12                                    | 0.23                         | 0.22                          | 535.79                                  | 3.09      | 10.87     | 36.62     | 1.04      | 2.03       | 1.97        | 4,821                 |
| Backhoe                     | 0  | 87        | 0.59                                  | 0.35                        | 1.25                       | 4.23                        | 0.12                                    | 0.24                         | 0.23                          | 535.77                                  | 0.00      | 0.00      | 0.00      | 0.00      | 0.00       | 0.00        | 0                     |
| On-road Equipment           | Cumulative Hours of Operation <sup>1</sup> | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (12 CY capacity) | 0  | 230       | 16                                    | 0.00165950                  | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3.38                                    | 0.00      | 0.00      | 0.00      | 0.00      | 0.00       | 0.00        | 0                     |
| Delivery Truck              | 0  | 365       | 45                                    | 0.00165950                  | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3.38                                    | 0.00      | 0.00      | 0.00      | 0.00      | 0.00       | 0.00        | 0                     |
| <b>Subtotal (lbs):</b>      |  |           |                                       |                             |                            |                             |   |                              |                               |   | <b>3</b>  | <b>11</b> | <b>37</b> | <b>1</b>  | <b>2</b>   | <b>2</b>    | <b>4,821</b>          |

**Table 4. Building Construction- Structure - 2013**

30,000 SF

| Off-road Equipment | Cumulative Hours of Operation | Engine HP | Load Factor | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|--------------------|-------------------------------|-----------|-------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|----------|-----------|-----------|------------|-------------|-----------------------|
| Crane              | 1,140                         | 330       | 0.58        | 0.25                        | 1.22                       | 5.26                        | 0.11                                    | 0.21                         | 0.20                          | 530                                     | 118.19    | 586.63   | 2530.18   | 54.87     | 99.92      | 96.93       | 255,096               |
| Concrete truck     | 150                           | 300       | 0.43        | 0.19                        | 1.45                       | 4.32                        | 0.12                                    | 0.21                         | 0.20                          | 536                                     | 8.00      | 62.05    | 184.32    | 4.92      | 8.96       | 8.69        | 22,877                |

|  |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|--|--------------------------------------|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| Diesel Generator (Assume 5 generators at 40 HP each) | 120                                  | 200              | 0.43   | 0.33                              | 2.54                             | 4.53                              | 0.13   | 0.54                               | 0.53                                | 595  | 7.46             | 57.82           | 103.01           | 2.91             | 12.33             | 11.96              | 13,541                      |
| <b>On-road Equipment</b>                             | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Diesel Pickup Truck                                  | 11                                   | 400              | 30   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 0.54             | 2.78            | 12.71            | 0.01             | 0.55              | 0.53               | 1,096                       |
| Delivery Truck                                       | 720                                  | 365              | 60   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 71.69            | 370.63          | 1694.32          | 0.79             | 73.05             | 70.94              | 146,121                     |
| <b>Subtotal (lbs):</b>                               |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>206</b>       | <b>1080</b>     | <b>4525</b>      | <b>64</b>        | <b>195</b>        | <b>189</b>         | <b>438,731</b>              |

Table 5. Concrete Work - Foundation and Sidewalks - 2013

Foundation Work 1,111 CY  
Total 1,111 CY Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

|  |                                      |                  |                    |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|--|--------------------------------------|------------------|--------------------|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>                    | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Load Factor</b> | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Concrete Mixer (3 mixers total to one truck) | 59                                   | 3.5              | 0.43               | 0.69                              | 3.04                             | 6.17                              | 0.13   | 0.54                               | 0.52                                | 588  | 0.13             | 0.59            | 1.20             | 0.02             | 0.10              | 0.10               | 114                         |
| Concrete Truck                               | 106                                  | 300              | 0.43               | 0.38                              | 1.75                             | 6.18                              | 0.11   | 0.27                               | 0.26                                | 530  | 11.42            | 52.54           | 186.06           | 3.43             | 8.09              | 7.84               | 15,947                      |
| <b>Subtotal (lbs):</b>                       |                                      |                  |                    |                                   |                                  |                                   |  |                                    |                                     |  | <b>12</b>        | <b>53</b>       | <b>187</b>       | <b>3</b>         | <b>8</b>          | <b>8</b>           | <b>16,061</b>               |

Table 6. Gravel Work for Building Construction - 2013

741 CY

|                              |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|------------------------------|--------------------------------------|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>    | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dozer                        | 7                                    | 185              | 0.59   | 0.34                              | 1.21                             | 4.08                              | 0.12   | 0.23                               | 0.22                                | 536  | 0.61             | 2.15            | 7.27             | 0.21             | 0.40              | 0.39               | 955                         |
| Wheel Loader for Spreading   | 9                                    | 87               | 0.59   | 0.35                              | 1.25                             | 4.23                              | 0.12   | 0.24                               | 0.23                                | 536  | 0.37             | 1.31            | 4.44             | 0.12             | 0.25              | 0.24               | 561                         |
| Compactor                    | 5                                    | 103              | 0.43   | 0.36                              | 1.34                             | 4.45                              | 0.12   | 0.26                               | 0.25                                | 536  | 0.19             | 0.72            | 2.39             | 0.06             | 0.14              | 0.13               | 287                         |
| <b>On-road Equipment</b>     | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck (gravel delivery) | 96                                   | 230              | 26   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 4.10             | 21.18           | 96.84            | 0.04             | 4.18              | 4.05               | 8,352                       |
| <b>Subtotal (lbs):</b>       |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>5</b>         | <b>25</b>       | <b>111</b>       | <b>0</b>         | <b>5</b>          | <b>5</b>           | <b>10,155</b>               |

Table 7. Site Prep for Parking Area- 2013

Grading (SY) 100,680 SF Convert 11,186 SY Assume compact 0.5 feet (0.166 yards) 1,864 CY compacted

|                             |  |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|-----------------------------|--|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>   | <b>Cumulative Hours of Operation<sup>1</sup></b> | <b>Engine HP</b> | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Excavator                   | 0  | 243              | 0.59   | 0.34                              | 1.21                             | 4.03                              | 0.12   | 0.22                               | 0.22                                | 535.79                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Skid Steer Loader           | 0  | 160              | 0.23   | 0.38                              | 1.47                             | 4.34                              | 0.12   | 0.31                               | 0.30                                | 535.67                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Grader                      | 83   | 285              | 0.58   | 0.34                              | 1.21                             | 4.07                              | 0.12   | 0.23                               | 0.22                                | 535.79                                       | 10.38            | 36.47           | 122.90           | 3.48             | 6.81              | 6.61               | 16,178                      |
| Backhoe                     | 0  | 87               | 0.59   | 0.35                              | 1.25                             | 4.23                              | 0.12   | 0.24                               | 0.23                                | 535.77                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| <b>On-road Equipment</b>    | <b>Cumulative Hours of Operation<sup>1</sup></b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck (12 CY capacity) | 0  | 230              | 16   | 0.00165950                        | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3.38   | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Delivery Truck              | 0  | 365              | 45   | 0.00165950                        | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3.38   | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| <b>Subtotal (lbs):</b>      |  |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>10</b>        | <b>36</b>       | <b>123</b>       | <b>3</b>         | <b>7</b>          | <b>7</b>           | <b>16,178</b>               |

Table 8. Paving Surface and Paving HMA - 2013

Pavement - Surface Area 100,000 SF  
Paving - HMA 33,333 CF 1,235 CY

|                                    |                                       |                             |  |   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|------------------------------------|---------------------------------------|-----------------------------|--|---|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>          | <b>Cumulative Hours of Operation</b>  | <b>Engine HP</b>            | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr           | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Grader                             | 306                                   | 145                         | 0.59   | 0.38  | 1.41                             | 4.16                              | 0.12   | 0.30                               | 0.29                                | 536  | 21.74            | 81.57           | 240.36           | 6.66             | 17.08             | 16.57              | 30,942                      |
| Steel drum roller/vibratory roller | 613                                   | 401                         | 0.59   | 0.34  | 2.46                             | 5.53                              | 0.12   | 0.34                               | 0.33                                | 536  | 109.05           | 786.80          | 1,768.26         | 36.82            | 108.20            | 104.96             | 171,175                     |
| Paving Machine                     | 613                                   | 164                         | 0.59   | 0.38  | 1.44                             | 4.25                              | 0.12   | 0.30                               | 0.29                                | 536  | 49.65            | 188.48          | 555.58           | 15.06            | 39.20             | 38.02              | 69,991                      |
| Asphalt Curbing Machine            | 61                                    | 130                         | 0.59   | 0.40  | 1.57                             | 4.57                              | 0.12   | 0.32                               | 0.31                                | 536  | 4.09             | 16.26           | 47.29            | 1.19             | 3.31              | 3.21               | 5,548                       |
| <b>On-road Equipment</b>           | <b>Cumulative Hours of Operation</b>  | <b>Engine HP</b>            | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile           | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck                         | 739                                   | 230                         | 17   | 1.66E-03                                    | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 20.49            | 105.93          | 484.24           | 0.22             | 20.88             | 20.27              | 41,762                      |
| Water Truck                        | 980                                   | 230                         | 10   | 1.66E-03                                    | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 16.26            | 84.08           | 384.36           | 0.18             | 16.57             | 16.09              | 33,148                      |
| <b>Hot Mix Asphalt (HMA)</b>       | <b>Volume of HMA (ft<sup>3</sup>)</b> | <b>Weight of HMA (tons)</b> |  | <b>VOC<sup>3</sup></b><br>lb/ton of asphalt | <b>CO</b><br>lb/ton of asphalt   | <b>Nox</b><br>lb/ton of asphalt   | <b>SO<sub>2</sub></b><br>lb/ton of asphalt   | <b>PM10</b><br>lb/ton of asphalt   | <b>PM2.5</b><br>lb/ton of asphalt   | <b>CO<sub>2</sub></b><br>lb/ton of asphalt   | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Standard Hot Mix Asphalt           | 33,333                                | 2,417                       |  | 0.04  | -                                | -                                 | -  | -                                  | -                                   | -  | 96.67            | -               | -                | -                | -                 | -                  | -                           |
| <b>Subtotal (lbs):</b>             |                                       |                             |  |   |                                  |                                   |  |                                    |                                     |  | <b>318</b>       | <b>1,263</b>    | <b>3,480</b>     | <b>60</b>        | <b>205</b>        | <b>199</b>         | <b>352,565</b>              |



Table 9. Gravel Work for Parking Area - 2013

1,235 CY

| Off-road Equipment           | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|------------------------------|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|----------|-----------|-----------|------------|-------------|-----------------------|
| Dozer                        | 12                            | 185       | 0.59                                  | 0.34                        | 1.21                       | 4.08                        | 0.12                                    | 0.23                         | 0.22                          | 536                                     | 1.02      | 3.59     | 12.12     | 0.34      | 0.67       | 0.65        | 1,592                 |
| Wheel Loader for Spreading   | 15                            | 87        | 0.59                                  | 0.35                        | 1.25                       | 4.23                        | 0.12                                    | 0.24                         | 0.23                          | 536                                     | 0.61      | 2.18     | 7.39      | 0.20      | 0.42       | 0.40        | 936                   |
| Compactor                    | 9                             | 103       | 0.43                                  | 0.36                        | 1.34                       | 4.45                        | 0.12                                    | 0.26                         | 0.25                          | 536                                     | 0.32      | 1.20     | 3.98      | 0.10      | 0.23       | 0.22        | 478                   |
| On-road Equipment            | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (gravel delivery) | 159                           | 230       | 26                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 6.83      | 35.31    | 161.40    | 0.07      | 6.96       | 6.76        | 13,919                |
| Subtotal (lbs):              |                               |           |                                       |                             |                            |                             |   |                              |                               |   | 9         | 42       | 185       | 1         | 8          | 8           | 16,925                |

<sup>1</sup>US EPA NONROAD2008a Model

<sup>2</sup>MOVES (Motor Vehicle Emission Simulator) 2010

Table 10. Fugitive Dust for Demolition and Construction Projects

| Year | PM <sub>10</sub><br>tons/acre/mo | acres | days of disturbance | PM <sub>10</sub> Total | PM <sub>2.5</sub> /PM <sub>10</sub> Ratio | PM <sub>2.5</sub> Total |
|------|----------------------------------|-------|---------------------|------------------------|---|-------------------------|
| 2013 | 0.42                             | 4     | 240                 | 20.2                   | 0.1                                       | 2.0                     |

Table 11. Annual Construction Worker POVs 2013 (<sup>1</sup>while onsite)

| 50 construction workers |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       |                      |          |           |                       |                        |                         |                          |                      |                       |    |  |    |      |      |
|-------------------------|------------|--------|---------------------|----------------------------|--------------------------|---------------------------|---------------------------------------|--|---|--------------------------------------|--------------------------------------|---------------------------------------|----------------------|----------|-----------|-----------------------|------------------------|-------------------------|--------------------------|----------------------|-----------------------|----|--|----|------|------|
| Vehicles                | # vehicles | # days | <sup>1</sup> mi/day | <sup>2</sup> VOCs<br>lb/mi | <sup>2</sup> CO<br>lb/mi | <sup>2</sup> NOx<br>lb/mi | <sup>2</sup> SO <sub>2</sub><br>lb/mi | <sup>2</sup> PM <sub>10</sub><br>lb/mi | <sup>2</sup> PM <sub>2.5</sub><br>lb/mi | <sup>2</sup> CO <sub>2</sub><br>g/mi | <sup>2</sup> CH <sub>4</sub><br>g/mi | <sup>2</sup> N <sub>2</sub> O<br>g/mi | VOCs<br>lb           | CO<br>lb | NOx<br>lb | SO <sub>2</sub><br>lb | PM <sub>10</sub><br>lb | PM <sub>2.5</sub><br>lb | CO <sub>2</sub><br>g     | CH <sub>4</sub><br>g | N <sub>2</sub> O<br>g |    |  |    |      |      |
| passenger vehicles      | 125        | 240    | 4                   | 0.00011658                 | 0.01381833               | 0.00081832                | 0.00000618                            | 0.00006769                             | 0.00006138                              | 182.00                               | 0.02                                 | 0.02                                  | 13.99                | 1658.20  | 98.20     | 0.74                  | 8.12                   | 7.37                    | 21,840,000               | 1,920                | 1,920                 |    |  |    |      |      |
|                         |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       | Tons per Year        |          | 0.01      | 0.83                  | 0.05                   | 0.00                    | 0.00                     | 0.00                 |                       |    |  |    |      |      |
|                         |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       | Metric Tons per Year |          |           |                       |                        |                         |                          |                      |                       |    |  | 22 | 0.00 | 0.00 |
|                         |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       |                      |          |           |                       |                        |                         | CO2e in metric tons/year |                      |                       | 22 |  |    |      |      |

<sup>1</sup>Construction worker vehicle emissions based on driving onsite (lunch, breaks, ingress, egress).

<sup>2</sup>Emission factors from MOVES2010

<sup>3</sup>Emission Factors from Federal Greenhouse Gas Accounting and Reporting Guidance: Technical Support Document (CEQ, 2010), Table D-11

Table 12. Scenario 1 Summary

| VOC<br>T/yr | CO<br>T/yr | NOx<br>T/yr | SO2<br>T/yr | PM10<br>T/yr | PM2.5<br>T/yr | CO <sub>2</sub> e<br>MT/yr |
|-------------|------------|-------------|-------------|--------------|---------------|----------------------------|
| 0.30        | 2.14       | 4.49        | 0.07        | 20.39        | 2.24          | 424                        |

**TAB B. CONSTRUCTION EMISSIONS - SCENARIO 2**  
**Large Demolition and Construction Effort, Nellis Air Force Base**

**Basic Conversions**  
453.59 grams per pound  
43,560 Conversion from Acre to SF  
0.03704 Cubic feet to Cubic Yards  
0.1111 Square Feet to Square Yards  
1.4 tons/CY for Gravel  
80,000 lbs/Truck Load for Delivery  
1.66 CY for each CY of asphalt/concrete demo  
0.333333333 asphalt thickness for demolition  
0.333333333 asphalt thickness for pavement  
2000 pounds per ton  
145 lb/ft<sup>3</sup> density of Hot Mix Asphalt

**Table 1. Building Demolition - 2013**

6,000 SF                      300 Estimated CY of debris based on 20 SF/CY

| Off-road Equipment                                    | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|---|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|-----------|-----------|-----------|------------|-------------|-----------------------|
| Hydraulic excavator with breakers and jackhammer bits | 50                            | 86        | 0.59                                  | 0.45                        | 3.84                       | 4.70                        | 0.13                                    | 0.45                         | 0.43                          | 594.79                                  | 2.52      | 21.48     | 26.29     | 0.72      | 2.50       | 2.42        | 3,327                 |
| Wheel Loader w/ integral Backhoe                      | 50                            | 87        | 0.23                                  | 1.43                        | 7.35                       | 6.35                        | 0.15                                    | 1.06                         | 1.03                          | 691.66                                  | 3.16      | 16.21     | 14.00     | 0.33      | 2.35       | 2.27        | 1,526                 |
| Wheel mounted air compressor                          | 50                            | 49        | 0.43                                  | 0.33                        | 2.54                       | 4.53                        | 0.13                                    | 0.54                         | 0.53                          | 595.16                                  | 0.76      | 5.90      | 10.52     | 0.30      | 1.26       | 1.22        | 1,382                 |
| On-road Equipment                                     | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb  | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (12 CY Capacity)                           | 28                            | 230       | 27                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 1.24      | 6.43      | 29.42     | 0.01      | 1.27       | 1.23        | 2,537                 |
| <b>Subtotal (lbs):</b>                                |                               |           |                                       |                             |                            |                             |   |                              |                               |   | <b>8</b>  | <b>50</b> | <b>80</b> | <b>1</b>  | <b>7</b>   | <b>7</b>    | <b>8,772</b>          |

**Table 2. Demo Asphalt/Concrete- 2013**

150,000 SF                      3,074 CY

| Off-road Equipment   | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb   | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|--|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|------------|------------|-----------|------------|-------------|-----------------------|
| D-6K Crawler Dozer with attachments  | 363                           | 125       | 0.58                                  | 0.34                        | 1.21                       | 4.08                        | 0.12                                    | 0.23                         | 0.22                          | 536                                     | 19.94     | 70.03      | 236.66     | 6.68      | 13.11      | 12.72       | 31,076                |
| Wheel mounted air compressor   | 363                           | 49        | 0.59                                  | 0.33                        | 2.54                       | 4.53                        | 0.13                                    | 0.54                         | 0.53                          | 595                                     | 7.58      | 58.78      | 104.71     | 2.96      | 12.53      | 12.16       | 13,765                |
| Pneumatic Paving Breaker and jackhammer on excavator (CAT 345D L or similar) | 125                           | 380       | 0.59                                  | 0.31                        | 2.50                       | 4.51                        | 0.13                                    | 0.55                         | 0.54                          | 595                                     | 19.29     | 154.27     | 278.45     | 7.91      | 34.10      | 33.08       | 36,775                |
| On-road Equipment  | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb   | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck   | 282                           | 230       | 27                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 12.75     | 65.94      | 301.44     | 0.14      | 13.00      | 12.62       | 25,997                |
| <b>Subtotal (lbs):</b>   |                               |           |                                       |                             |                            |                             |   |                              |                               |   | <b>60</b> | <b>283</b> | <b>620</b> | <b>18</b> | <b>60</b>  | <b>58</b>   | <b>81,617</b>         |

**Table 3. Site Prep for Building Construction - 2013**  
Grading (SY)                      90,000 SF                      Convert                      9,999 SY                      Assume compact 0.5 feet (0.166 yards)                      1,667 CY compacted

| Off-road Equipment          | Cumulative Hours of Operation <sup>1</sup> | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb  | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|-----------------------------|--|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|-----------|------------|-----------|------------|-------------|-----------------------|
| Excavator                   | 0  | 243       | 0.59                                  | 0.34                        | 1.21                       | 4.03                        | 0.12                                    | 0.22                         | 0.22                          | 535.79                                  | 0.00      | 0.00      | 0.00       | 0.00      | 0.00       | 0.00        | 0                     |
| Skid Steer Loader           | 0  | 160       | 0.23                                  | 0.38                        | 1.47                       | 4.34                        | 0.12                                    | 0.31                         | 0.30                          | 535.67                                  | 0.00      | 0.00      | 0.00       | 0.00      | 0.00       | 0.00        | 0                     |
| Grader                      | 74   | 285       | 0.58                                  | 0.34                        | 1.21                       | 4.07                        | 0.12                                    | 0.23                         | 0.22                          | 535.79                                  | 9.28      | 32.60     | 109.86     | 3.11      | 6.09       | 5.91        | 14,462                |
| Backhoe                     | 0  | 87        | 0.59                                  | 0.35                        | 1.25                       | 4.23                        | 0.12                                    | 0.24                         | 0.23                          | 535.77                                  | 0.00      | 0.00      | 0.00       | 0.00      | 0.00       | 0.00        | 0                     |
| On-road Equipment           | Cumulative Hours of Operation <sup>1</sup> | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb  | NOx<br>lb  | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (12 CY capacity) | 0  | 230       | 16                                    | 0.00165950                  | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3.38                                    | 0.00      | 0.00      | 0.00       | 0.00      | 0.00       | 0.00        | 0                     |
| Delivery Truck              | 0  | 365       | 45                                    | 0.00165950                  | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3.38                                    | 0.00      | 0.00      | 0.00       | 0.00      | 0.00       | 0.00        | 0                     |
| <b>Subtotal (lbs):</b>      |  |           |                                       |                             |                            |                             |   |                              |                               |   | <b>9</b>  | <b>33</b> | <b>110</b> | <b>3</b>  | <b>6</b>   | <b>6</b>    | <b>14,462</b>         |

**Table 4. Building Construction- Structure - 2013**

90,000 SF

| Off-road Equipment | Cumulative Hours of Operation | Engine HP | Load Factor | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|--------------------|-------------------------------|-----------|-------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|----------|-----------|-----------|------------|-------------|-----------------------|
| Crane              | 3,420                         | 330       | 0.58        | 0.25                        | 1.22                       | 5.26                        | 0.11                                    | 0.21                         | 0.20                          | 530                                     | 354.58    | 1759.90  | 7590.54   | 164.62    | 299.77     | 290.78      | 765,288               |
| Concrete truck     | 450                           | 300       | 0.43        | 0.19                        | 1.45                       | 4.32                        | 0.12                                    | 0.21                         | 0.20                          | 536                                     | 24.01     | 186.15   | 552.96    | 14.76     | 26.88      | 26.08       | 68,630                |

|   |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|---|--------------------------------------|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| Diesel Generator for on-site power tools and office support (Assume 5 generators at 40 HP each) | 360                                  | 200              | 0.43   | 0.33                              | 2.54                             | 4.53                              | 0.13   | 0.54                               | 0.53                                | 595  | 22.37            | 173.46          | 309.02           | 8.74             | 36.99             | 35.88              | 40,623                      |
| <b>On-road Equipment</b>  | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Diesel Pickup Truck   | 32                                   | 400              | 30   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 1.61             | 8.34            | 38.12            | 0.02             | 1.64              | 1.60               | 3,288                       |
| Delivery Truck  | 2,160                                | 365              | 60   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 215.07           | 1111.89         | 5082.97          | 2.36             | 219.16            | 212.82             | 438,364                     |
| <b>Subtotal (lbs):</b>  |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>618</b>       | <b>3240</b>     | <b>13574</b>     | <b>191</b>       | <b>584</b>        | <b>567</b>         | <b>1,316,193</b>            |

Table 5. Concrete Work - Foundation and Sidewalks - 2013

Foundation Work 90,000 CY  
Total 90,000 CY Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

|  |                                      |                  |                    |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|--|--------------------------------------|------------------|--------------------|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>                    | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Load Factor</b> | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Concrete Mixer (3 mixers total to one truck) | 4,739                                | 3.5              | 0.43               | 0.69                              | 3.04                             | 6.17                              | 0.13   | 0.54                               | 0.52                                | 588  | 10.81            | 47.87           | 97.05            | 1.99             | 8.50              | 8.24               | 9,251                       |
| Concrete Truck                               | 8,571                                | 300              | 0.43               | 0.38                              | 1.75                             | 6.18                              | 0.11   | 0.27                               | 0.26                                | 530  | 925.26           | 4,255.61        | 15,070.85        | 277.86           | 655.01            | 635.36             | 1,291,718                   |
| <b>Subtotal (lbs):</b>                       |                                      |                  |                    |                                   |                                  |                                   |  |                                    |                                     |  | <b>936</b>       | <b>4,303</b>    | <b>15,168</b>    | <b>280</b>       | <b>664</b>        | <b>644</b>         | <b>1,300,969</b>            |

Table 6. Gravel Work for Building Construction - 2013

2,222 CY

|                              |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|------------------------------|--------------------------------------|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>    | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dozer                        | 22                                   | 185              | 0.59   | 0.34                              | 1.21                             | 4.08                              | 0.12   | 0.23                               | 0.22                                | 536  | 1.84             | 6.46            | 21.82            | 0.62             | 1.21              | 1.17               | 2,865                       |
| Wheel Loader for Spreading   | 28                                   | 87               | 0.59   | 0.35                              | 1.25                             | 4.23                              | 0.12   | 0.24                               | 0.23                                | 536  | 1.10             | 3.92            | 13.31            | 0.36             | 0.75              | 0.73               | 1,684                       |
| Compactor                    | 16                                   | 103              | 0.43   | 0.36                              | 1.34                             | 4.45                              | 0.12   | 0.26                               | 0.25                                | 536  | 0.58             | 2.15            | 7.16             | 0.19             | 0.41              | 0.40               | 861                         |
| <b>On-road Equipment</b>     | <b>Cumulative Hours of Operation</b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck (gravel delivery) | 287                                  | 230              | 26   | 1.66E-03                          | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 12.29            | 63.55           | 290.52           | 0.13             | 12.53             | 12.16              | 25,055                      |
| <b>Subtotal (lbs):</b>       |                                      |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>16</b>        | <b>76</b>       | <b>333</b>       | <b>1</b>         | <b>15</b>         | <b>14</b>          | <b>30,465</b>               |

Table 7. Site Prep for Parking Area- 2013

Grading (SY) 345,600 SF Convert 38,396 SY Assume compact 0.5 feet (0.166 yards) 6,399 CY compacted

|                             |  |                  |  |                                   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|-----------------------------|--|------------------|--|-----------------------------------|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>   | <b>Cumulative Hours of Operation<sup>1</sup></b> | <b>Engine HP</b> | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Excavator                   | 0  | 243              | 0.59   | 0.34                              | 1.21                             | 4.03                              | 0.12   | 0.22                               | 0.22                                | 535.79                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Skid Steer Loader           | 0  | 160              | 0.23   | 0.38                              | 1.47                             | 4.34                              | 0.12   | 0.31                               | 0.30                                | 535.67                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Grader                      | 284  | 285              | 0.58   | 0.34                              | 1.21                             | 4.07                              | 0.12   | 0.23                               | 0.22                                | 535.79                                       | 35.63            | 125.20          | 421.86           | 11.95            | 23.38             | 22.68              | 55,534                      |
| Backhoe                     | 0  | 87               | 0.59   | 0.35                              | 1.25                             | 4.23                              | 0.12   | 0.24                               | 0.23                                | 535.77                                       | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| <b>On-road Equipment</b>    | <b>Cumulative Hours of Operation<sup>2</sup></b> | <b>Engine HP</b> | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck (12 CY capacity) | 0  | 230              | 16   | 0.00165950                        | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3.38   | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| Delivery Truck              | 0  | 365              | 45   | 0.00165950                        | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3.38   | 0.00             | 0.00            | 0.00             | 0.00             | 0.00              | 0.00               | 0                           |
| <b>Subtotal (lbs):</b>      |  |                  |  |                                   |                                  |                                   |  |                                    |                                     |  | <b>36</b>        | <b>125</b>      | <b>422</b>       | <b>12</b>        | <b>23</b>         | <b>23</b>          | <b>55,534</b>               |

Table 8. Paving Surface and Paving HMA - 2013

Pavement - Surface Area 300,000 SF  
Paving - HMA 100,000 CF 3,704 CY

|                                    |                                       |                             |  |   |                                  |                                   |  |                                    |                                     |  |                  |                 |                  |                  |                   |                    |                             |
|------------------------------------|---------------------------------------|-----------------------------|--|---|----------------------------------|-----------------------------------|--|------------------------------------|-------------------------------------|--|------------------|-----------------|------------------|------------------|-------------------|--------------------|-----------------------------|
| <b>Off-road Equipment</b>          | <b>Cumulative Hours of Operation</b>  | <b>Engine HP</b>            | <b>Load Factor</b>                           | <b>VOC<sup>1</sup></b><br>g/hp-hr           | <b>CO<sup>1</sup></b><br>g/hp-hr | <b>NOx<sup>1</sup></b><br>g/hp-hr | <b>SO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>PM10<sup>1</sup></b><br>g/hp-hr | <b>PM2.5<sup>1</sup></b><br>g/hp-hr | <b>CO<sub>2</sub><sup>1</sup></b><br>g/hp-hr | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Grader                             | 919                                   | 145                         | 0.59   | 0.38  | 1.41                             | 4.16                              | 0.12   | 0.30                               | 0.29                                | 536  | 65.22            | 244.70          | 721.08           | 19.97            | 51.24             | 49.70              | 92,826                      |
| Steel drum roller/vibratory roller | 1,838                                 | 401                         | 0.59   | 0.34  | 2.46                             | 5.53                              | 0.12   | 0.34                               | 0.33                                | 536  | 327.16           | 2,360.41        | 5,304.79         | 110.46           | 324.61            | 314.87             | 513,524                     |
| Paving Machine                     | 1,838                                 | 164                         | 0.59   | 0.38  | 1.44                             | 4.25                              | 0.12   | 0.30                               | 0.29                                | 536  | 148.95           | 565.43          | 1,666.73         | 45.17            | 117.59            | 114.07             | 209,974                     |
| Asphalt Curbing Machine            | 184                                   | 130                         | 0.59   | 0.40  | 1.57                             | 4.57                              | 0.12   | 0.32                               | 0.31                                | 536  | 12.28            | 48.79           | 141.87           | 3.58             | 9.92              | 9.62               | 16,643                      |
| <b>On-road Equipment</b>           | <b>Cumulative Hours of Operation</b>  | <b>Engine HP</b>            | <b>Productivity based Speed (miles/hour)</b> | <b>VOC<sup>2</sup></b><br>lb/mile           | <b>CO<sup>2</sup></b><br>lb/mile | <b>NOx<sup>2</sup></b><br>lb/mile | <b>SO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>PM10<sup>2</sup></b><br>lb/mile | <b>PM2.5<sup>2</sup></b><br>lb/mile | <b>CO<sub>2</sub><sup>2</sup></b><br>lb/mile | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |
| Dump Truck                         | 2,217                                 | 230                         | 17   | 1.66E-03                                    | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 61.47            | 317.78          | 1,452.72         | 0.67             | 62.64             | 60.82              | 125,285                     |
| Water Truck                        | 2,940                                 | 230                         | 10   | 1.66E-03                                    | 8.58E-03                         | 3.92E-02                          | 1.82E-05                                     | 1.69E-03                           | 1.64E-03                            | 3  | 48.79            | 252.23          | 1,153.08         | 0.54             | 49.72             | 48.28              | 99,444                      |
| <b>Hot Mix Asphalt (HMA)</b>       | <b>Volume of HMA (ft<sup>3</sup>)</b> | <b>Weight of HMA (tons)</b> |  | <b>VOC<sup>3</sup></b><br>lb/ton of asphalt | <b>CO</b><br>lb/ton of asphalt   | <b>Nox</b><br>lb/ton of asphalt   | <b>SO<sub>2</sub></b><br>lb/ton of asphalt   | <b>PM10</b><br>lb/ton of asphalt   | <b>PM2.5</b><br>lb/ton of asphalt   | <b>CO<sub>2</sub></b><br>lb/ton of asphalt   | <b>VOC</b><br>lb | <b>CO</b><br>lb | <b>NOx</b><br>lb | <b>SO2</b><br>lb | <b>PM10</b><br>lb | <b>PM2.5</b><br>lb | <b>CO<sub>2</sub></b><br>lb |

|                          |         |       |      |   |   |   |   |   |   |        |       |        |     |     |     |           |
|--------------------------|---------|-------|------|---|---|---|---|---|---|--------|-------|--------|-----|-----|-----|-----------|
| Standard Hot Mix Asphalt | 100,000 | 7,250 | 0.04 | - | - | - | - | - | - | 290.00 | -     | -      | -   | -   | -   | -         |
| Subtotal (lbs):          |         |       |      |   |   |   |   |   |   | 954    | 3,789 | 10,440 | 180 | 616 | 597 | 1,057,695 |

Table 9. Gravel Work for Parking Area - 2013

3,704 CY

| Off-road Equipment           | Cumulative Hours of Operation | Engine HP | Load Factor                           | VOC <sup>1</sup><br>g/hp-hr | CO <sup>1</sup><br>g/hp-hr | NOx <sup>1</sup><br>g/hp-hr | SO <sub>2</sub> <sup>1</sup><br>g/hp-hr | PM10 <sup>1</sup><br>g/hp-hr | PM2.5 <sup>1</sup><br>g/hp-hr | CO <sub>2</sub> <sup>1</sup><br>g/hp-hr | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
|------------------------------|-------------------------------|-----------|---------------------------------------|-----------------------------|----------------------------|-----------------------------|---|------------------------------|-------------------------------|---|-----------|----------|-----------|-----------|------------|-------------|-----------------------|
| Dozer                        | 37                            | 185       | 0.59                                  | 0.34                        | 1.21                       | 4.08                        | 0.12                                    | 0.23                         | 0.22                          | 536                                     | 3.06      | 10.76    | 36.36     | 1.03      | 2.01       | 1.95        | 4,775                 |
| Wheel Loader for Spreading   | 46                            | 87        | 0.59                                  | 0.35                        | 1.25                       | 4.23                        | 0.12                                    | 0.24                         | 0.23                          | 536                                     | 1.83      | 6.54     | 22.18     | 0.60      | 1.25       | 1.21        | 2,807                 |
| Compactor                    | 27                            | 103       | 0.43                                  | 0.36                        | 1.34                       | 4.45                        | 0.12                                    | 0.26                         | 0.25                          | 536                                     | 0.96      | 3.59     | 11.93     | 0.31      | 0.69       | 0.67        | 1,435                 |
| On-road Equipment            | Cumulative Hours of Operation | Engine HP | Productivity based Speed (miles/hour) | VOC <sup>2</sup><br>lb/mile | CO <sup>2</sup><br>lb/mile | NOx <sup>2</sup><br>lb/mile | SO <sub>2</sub> <sup>2</sup><br>lb/mile | PM10 <sup>2</sup><br>lb/mile | PM2.5 <sup>2</sup><br>lb/mile | CO <sub>2</sub> <sup>2</sup><br>lb/mile | VOC<br>lb | CO<br>lb | NOx<br>lb | SO2<br>lb | PM10<br>lb | PM2.5<br>lb | CO <sub>2</sub><br>lb |
| Dump Truck (gravel delivery) | 478                           | 230       | 26                                    | 1.66E-03                    | 8.58E-03                   | 3.92E-02                    | 1.82E-05                                | 1.69E-03                     | 1.64E-03                      | 3                                       | 20.49     | 105.92   | 484.20    | 0.22      | 20.88      | 20.27       | 41,758                |
| Subtotal (lbs):              |                               |           |                                       |                             |                            |                             |   |                              |                               | 3                                       | 26        | 127      | 555       | 2         | 25         | 24          | 50,776                |

<sup>1</sup>US EPA NONROAD2008a Model

<sup>2</sup>MOVES (Motor Vehicle Emission Simulator) 2010

Table 10. Fugitive Dust for Demolition and Construction Projects

| Year | PM <sub>10</sub><br>tons/acre/mo | acres | days of disturbance | PM <sub>10</sub> Total | PM <sub>2.5</sub> /PM <sub>10</sub> Ratio | PM <sub>2.5</sub> Total |
|------|----------------------------------|-------|---------------------|------------------------|---|-------------------------|
| 2013 | 0.42                             | 13    | 240                 | 65.5                   | 0.1                                       | 6.6                     |

Table 11. Annual Construction Worker POVs 2013 (<sup>1</sup>while onsite)

| 50 construction workers               |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       | VOCs                 | CO      | NOx    | SO <sub>2</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> | CO <sub>2</sub> | CH <sub>4</sub> | N <sub>2</sub> O |      |      |
|---------------------------------------|------------|--------|---------------------|----------------------------|--------------------------|---------------------------|---------------------------------------|--|---|--------------------------------------|--------------------------------------|---------------------------------------|----------------------|---------|--------|-----------------|------------------|-------------------|-----------------|-----------------|------------------|------|------|
| Vehicles                              | # vehicles | # days | <sup>1</sup> mi/day | <sup>2</sup> VOCs<br>lb/mi | <sup>2</sup> CO<br>lb/mi | <sup>2</sup> NOx<br>lb/mi | <sup>2</sup> SO <sub>2</sub><br>lb/mi | <sup>2</sup> PM <sub>10</sub><br>lb/mi | <sup>2</sup> PM <sub>2.5</sub><br>lb/mi | <sup>3</sup> CO <sub>2</sub><br>g/mi | <sup>3</sup> CH <sub>4</sub><br>g/mi | <sup>3</sup> N <sub>2</sub> O<br>g/mi | lb                   | lb      | lb     | lb              | lb               | g                 | g               | g               |                  |      |      |
| carpool                               | 0          | 0      | 0                   | 0.00011658                 | 0.01381833               | 0.00081832                | 0.00000618                            | 0.00006769                             | 0.00006138                              | 182.00                               | 0.02                                 | 0.02                                  | 0.00                 | 0.00    | 0.00   | 0.00            | 0.00             | 0                 | 0               | 0               |                  |      |      |
| passenger vehicles                    | 375        | 240    | 4                   | 0.00011658                 | 0.01381833               | 0.00081832                | 0.00000618                            | 0.00006769                             | 0.00006138                              | 182.00                               | 0.02                                 | 0.02                                  | 41.97                | 4974.60 | 294.60 | 2.22            | 24.37            | 22.10             | 65,520,000      | 5,760           | 5,760            |      |      |
|                                       |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       | Tons per Year        |         | 0.02   | 2.49            | 0.15             | 0.00              | 0.01            | 0.01            |                  |      |      |
|                                       |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       | Metric Tons per Year |         |        |                 |                  |                   |                 |                 | 66               | 0.01 | 0.01 |
| CO <sub>2</sub> e in metric tons/year |            |        |                     |                            |                          |                           |                                       |  |   |                                      |                                      |                                       |                      |         |        |                 | 67               |                   |                 |                 |                  |      |      |

<sup>1</sup>Construction worker vehicle emissions based on driving onsite (lunch, breaks, ingress, egress).

<sup>2</sup>Emission factors from MOVES2010

<sup>3</sup>Emission Factors from *Federal Greenhouse Gas Accounting and Reporting Guidance: Technical Support Document* (CEQ, 2010), Table D-11

Table 12. Scenario 2 Summary

| VOC<br>T/yr | CO<br>T/yr | NOx<br>T/yr | SO2<br>T/yr | PM10<br>T/yr | PM2.5<br>T/yr | CO <sub>2</sub><br>MT/yr |
|-------------|------------|-------------|-------------|--------------|---------------|--------------------------|
| 1.35        | 8.50       | 20.80       | 0.35        | 66.53        | 7.53          | 1844                     |

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## **APPENDIX C**

# **ENVIRONMENTAL CHECKLIST**

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# ENVIRONMENTAL CHECKLIST

for Nellis Air Force Base Project Managers

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## **INSTRUCTIONS FOR USE**

This environmental checklist is designed to assist project managers at Nellis Air Force Base (AFB) in ensuring compliance with all federal, state, and local environmental permitting and reporting requirements.

### **1. Complete each section.**

The environmental checklist is divided into ten sections. Each section contains a flowchart of questions designed to identify projects or components of projects that may require environmental permits, notifications, or registrations. Answer all questions.

### **2. Use the terms and acronyms list.**

Although this checklist has been designed to minimize the use of "enviro-speak," the user of this manual must have an understanding of certain key regulatory terms, which are defined in the glossary.

### **3. Talk to the experts.**

The flow charts are intended to be used as a preliminary screening tool. If the screening process identifies a permit or regulatory requirement, the project manager should talk to the appropriate Nellis AFB Environmental Program Manager(s) who will assist in obtaining permit(s), implement reporting and/or testing requirements.

### **4. "I don't know" is not an acceptable answer.**

If information is not provided in the AF 813, then the proponent and the environmental program managers need to get together and determine the data requirements necessary to definitively answer any questions.

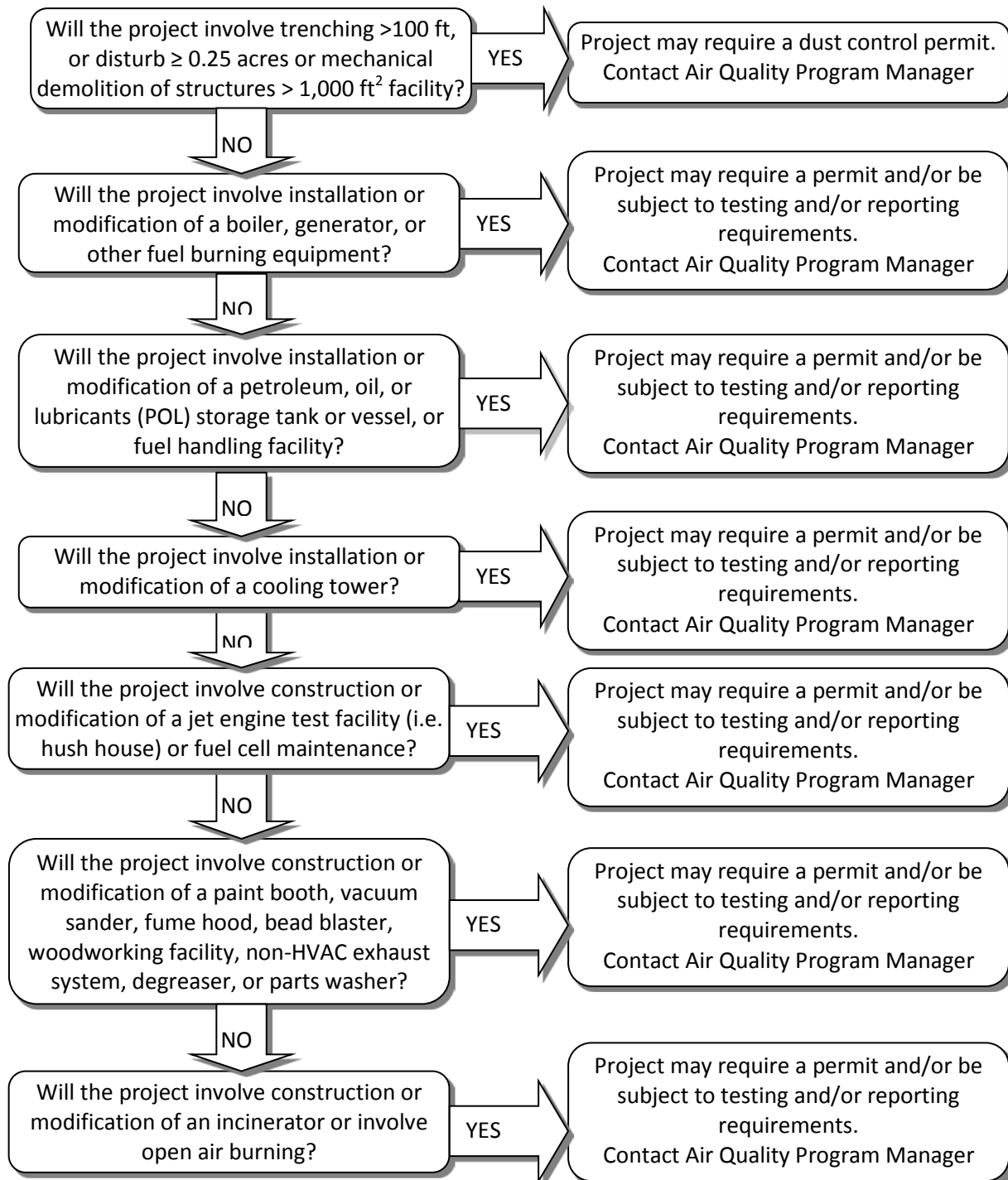
## AIR QUALITY

99 CES/CEIEC, 652-2882

Air emissions sources may be regulated based on the type of emission source, the type and/or quantity of pollutants being emitted, and the quality of air in the region where the emission source is located. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Air Quality Program Manager at 652-2882.

### AIR QUALITY FLOW CHART

99 CES/CEIEC 652-2882



## WATER QUALITY

### 99 CES/CEIEC, 652-2834

Any process that discharges to sanitary or industrial wastewater systems, storm drains or involves a discharge that can flow into surface or leech into groundwater affects water quality. Additionally, any modification to the drinking water system could require state approval. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Water Quality Program Manager at 652-2834.

### WATER QUALITY FLOW CHART

99 CES/CEIEC, 652-2834

#### Industrial Wastewater Discharges

Will the project result in the discharge of any wastewaters from commercial or industrial processes to ground or surface waters?

YES

Permit CCSD-010 does not limit the amount of effluent that Nellis AFB can discharge. Contact CES/CEIEC for more information

NO

Will the project result in the discharge of commercial or industrial process wastewaters to a *treatment works*?

YES

The project may require an approval, a new permit from the *treatment works*, or the modification of an existing permit from the *treatment works*. Contact CES/CEIEC or treatment works to determine the requirements

NO

Industrial/commercial wastewater discharge permit/approval from a *treatment works* is not required

#### Sanitary Wastewater

Will the project result in the discharge of any sanitary wastewaters (e.g., wastewater from sinks, showers, toilets, etc)?

YES

A permit may be required (see below).

- a) *Sanitary wastewater* discharged to a *treatment works* may require modifying an existing permit or obtaining a new permit from the *treatment works*. Contact 99 CES/CEIEC to determine requirements. See NAC 445A.254.
- b) *Sanitary wastewater* discharged to a septic system that in turn discharges to surface waters may require a permit. Contact 99 CES/CEIEC. See NAC 445A.230 and NAC 445A.266.
- c) Sanitary wastewaters discharged directly to surface water may require a permit. Contact 99 CES/CEIEC. See NAC 445A.230 and NAC 445A.266.
- d) Discharges to a septic system that uses ground absorption may require a permit from the local county. Contact the base environmental office (99 CES/CEIEC). See NAC 445A.228

## Stormwater Discharges

Does the project involve clearing, grading, or excavation activities on a total land area greater than 1 acre?

YES

A stormwater permit or modification to an existing National Pollution Discharge Elimination System (NPDES) permit may be required. Contact the 99 CES/CEIEC to determine requirements. See NAC 445A.230 and NAC 445A.266.

NO

Does the project involve the *construction* or modification of any of the following types of facilities?

- Transportation facilities which have vehicle maintenance, equipment cleaning or deicing (airfield) operations.
- *Hazardous waste* treatment, storage, or disposal facilities.
- Landfills, land application sites, open dumps.
- Recycling facilities, including metal scrap yards, battery reclaimers, salvage and junk yards (does not include gas stations or repair shops that collect tires or batteries).
- Steam electric power generating facilities, including coal handling sites.
- Electroplating, metal finishing facilities.
- Facilities whose effluent is otherwise subject to NPDES effluent standards.
- General warehousing and storage facilities or activities in which *stormwater* actually contacts materials, products, *material handling equipment* or *activities* or other associated industrial equipment.

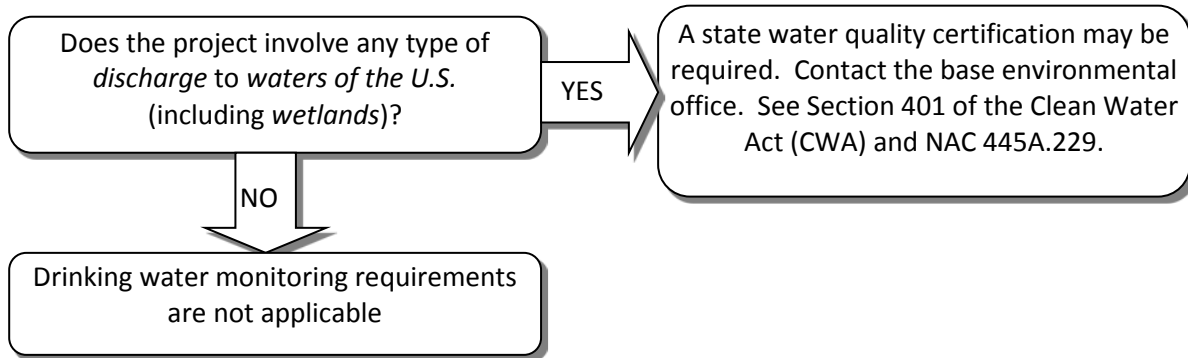
YES

Will the project result in the discharge of *stormwater* through a pipe, culvert or ditch to *surface waters* or to a separate storm sewer system?

YES

A stormwater permit or modification to an existing NPDES permit may be required. Contact 99 CES/CEIEC, the base environmental office. See NAC 445A.230 and NAC 445A.266.

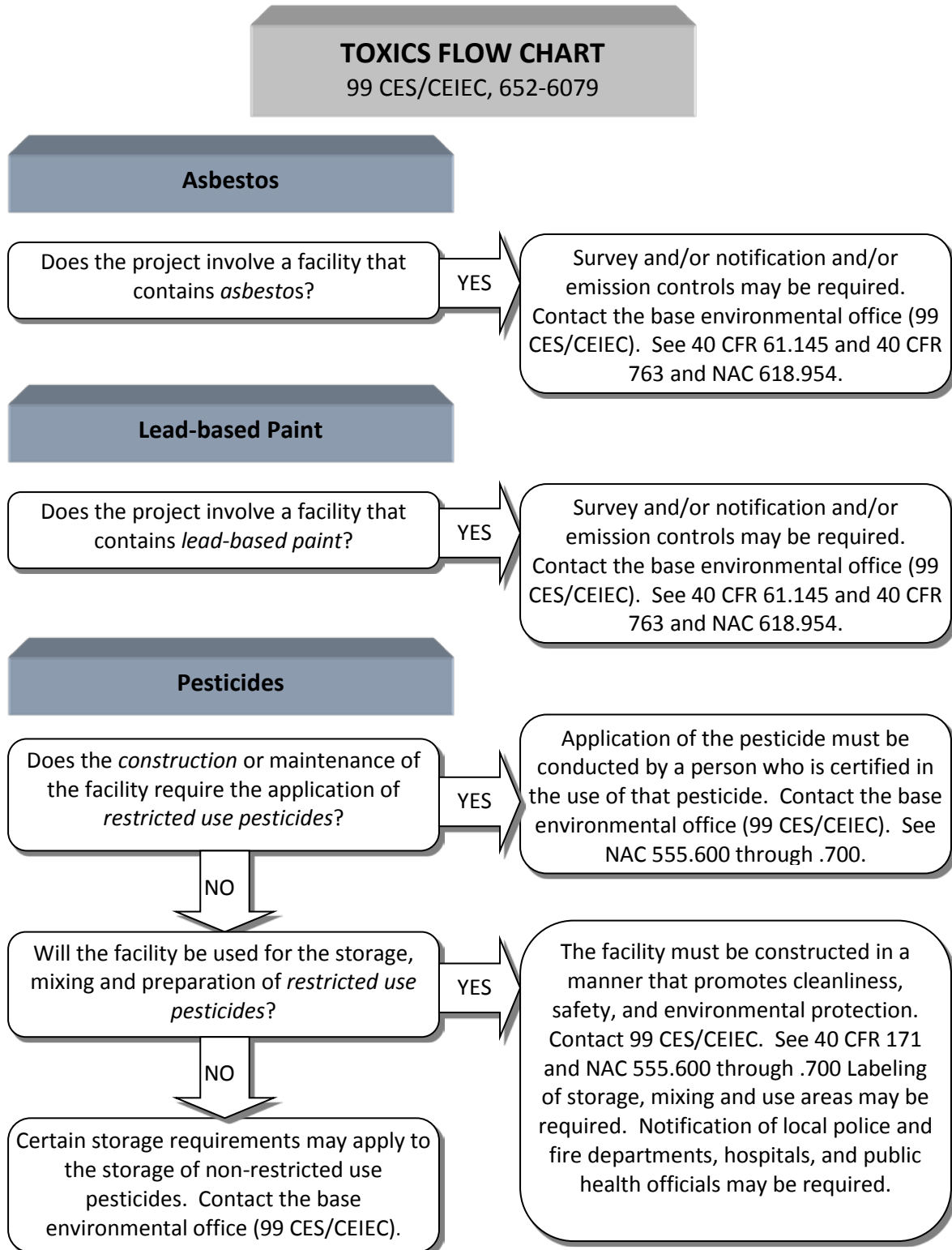
## Drinking Water



## TOXICS

### 99 CES/CEIEC, 652-6079

Activities involving disturbing, use, storage or disposal of asbestos, lead-based paint or pesticides require review by the toxics program manager. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Toxics Program Manager at 652-6079.



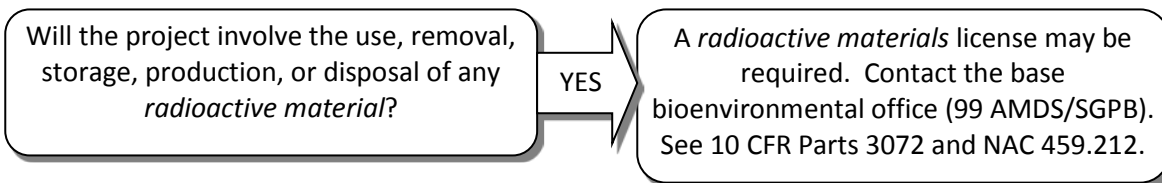
## **RADIOACTIVE MATERIALS/OCCUPATIONAL HEALTH**

### **99 AMDS/SGPB, 653-3310**

Activities involving disturbing, use, storage or disposal of radioactive materials require review by the Bioenvironmental Flight. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Bio-environmental Flight at 653-3310.

### **RADIOACTIVE MATERIALS FLOW CHART**

99 AMDS/SGPB, 653-3310

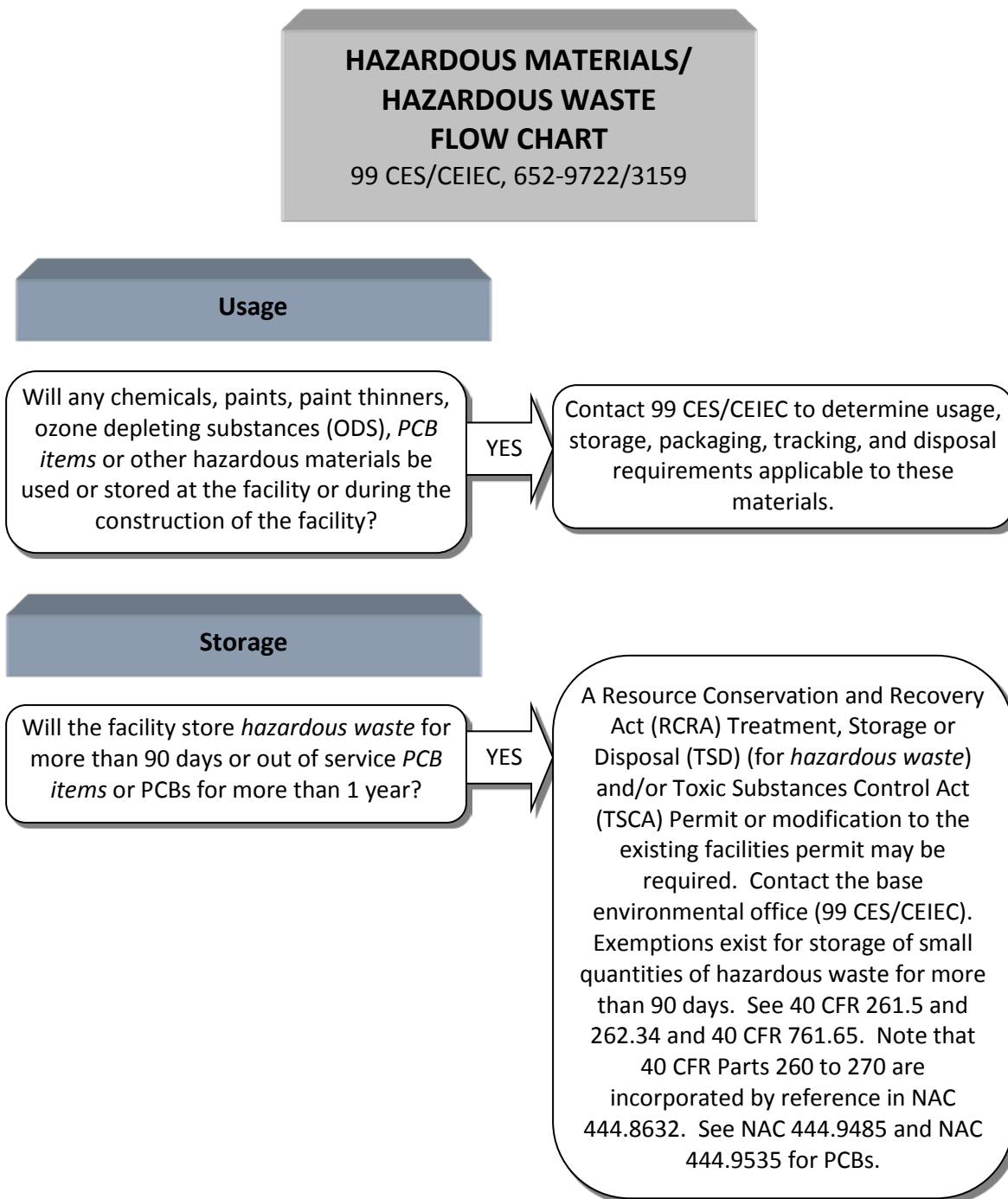




## HAZARDOUS MATERIALS/ HAZARDOUS WASTE

99 CES/CEIEC, 652-9722/99 CES/CEIEC, 652-3159

Storage, use, treatment or disposal of hazardous materials and waste require prior approval. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB HAZMART Program Manager at 652-9722 or the Nellis AFB RCRA Program Manager at 652-3159.



## Treatment

Will the facility treat *hazardous wastes* other than in a *totally enclosed treatment facility* or in an *elementary neutralization unit* or in a unit permitted under the CWA (see Section 1)?

YES

A RCRA TSD, and/or a TSCA permit or a modification to the facility's existing permit may be required. Contact 99 CES/CEIEC. See 40 CFR Parts 264 and 761 for design requirements. Note that 40 CFR Parts 260 to 270 are incorporated by reference in NAC 444.8632. See NAC 444.9485 and NAC 444.9535 for PCBs.

Will the facility treat *PCB items*?

YES

A TSCA treatment plant permit may be required. Contact 99 CES/CEIEC. See 40 CFR 761.70 and NAC 444.9485 and NAC 444.9535.

## Disposal

Will the facility be used for the *disposal* of *hazardous wastes* or *PCB items*?

YES

A RCRA TSD permit, or TSCA Permit, or a modification to the facilities existing permit may be required. Contact the base environmental office (99 CES/CEIEC). See 40 CFR Parts 264 and 761 for design requirements. Note that 40 CFR Parts 260 to 270 are incorporated by reference in NAC 444.8632. See NAC 444.9485 for PCBs.

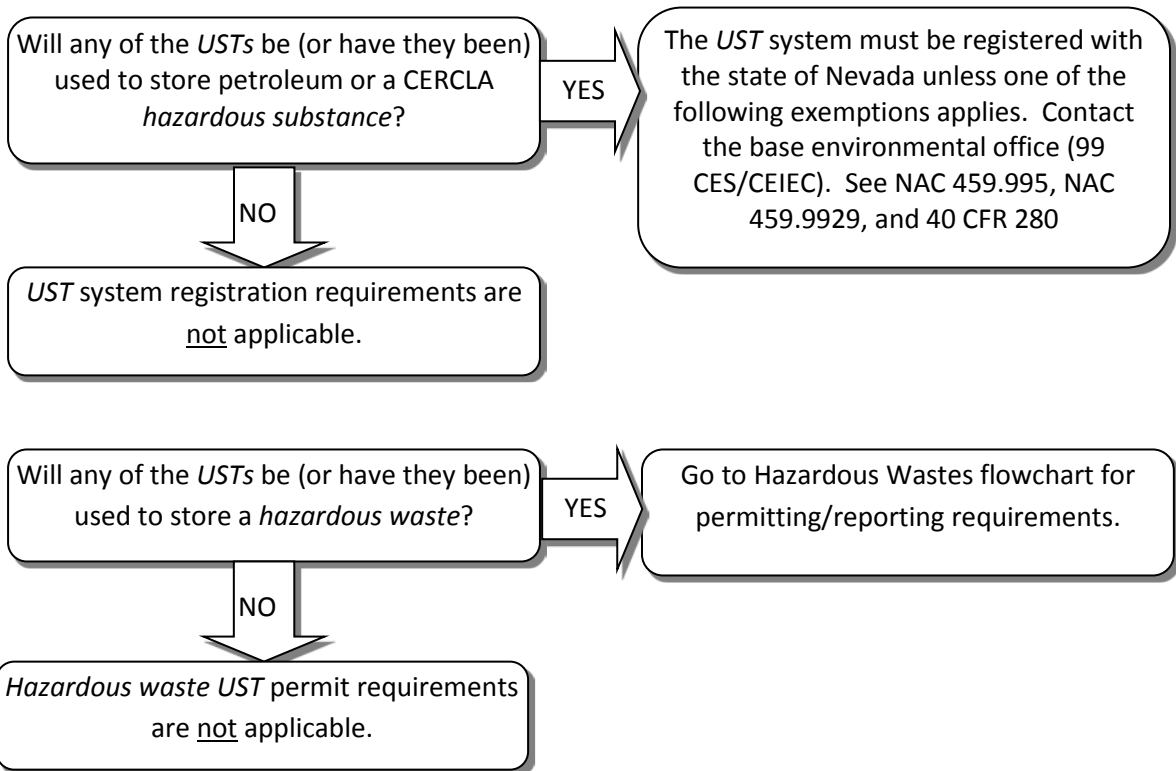
## STORAGE TANK (ASTs and USTs) 99 CES/CEIEC, 652-6121

Storage tanks used for fuel, heating oil or other fluids are required to meet certain standards and could require permitting. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB POL Program Manager at 652-6121.

### STORAGE TANKS (USTs/ASTs) FLOW CHART 99 CES/CEIEC, 652-6121

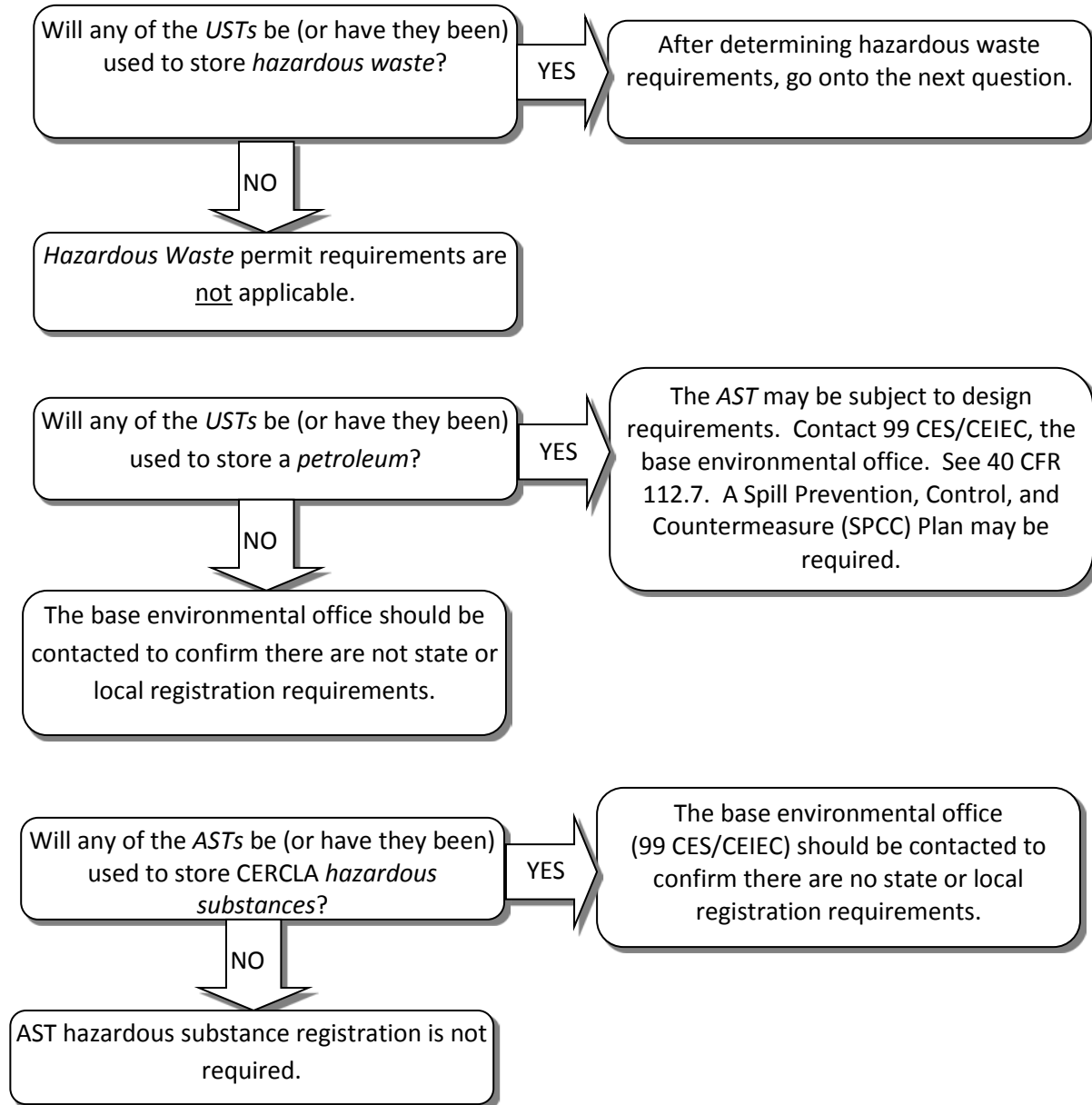
#### Underground Storage Tanks (USTs)

If any project involves the construction, removal or modification of an underground storage tanks (USTs) or associated piping, contact the Nellis AFB POL Program Manager, 99 CES/CEIEC at 652-6121.



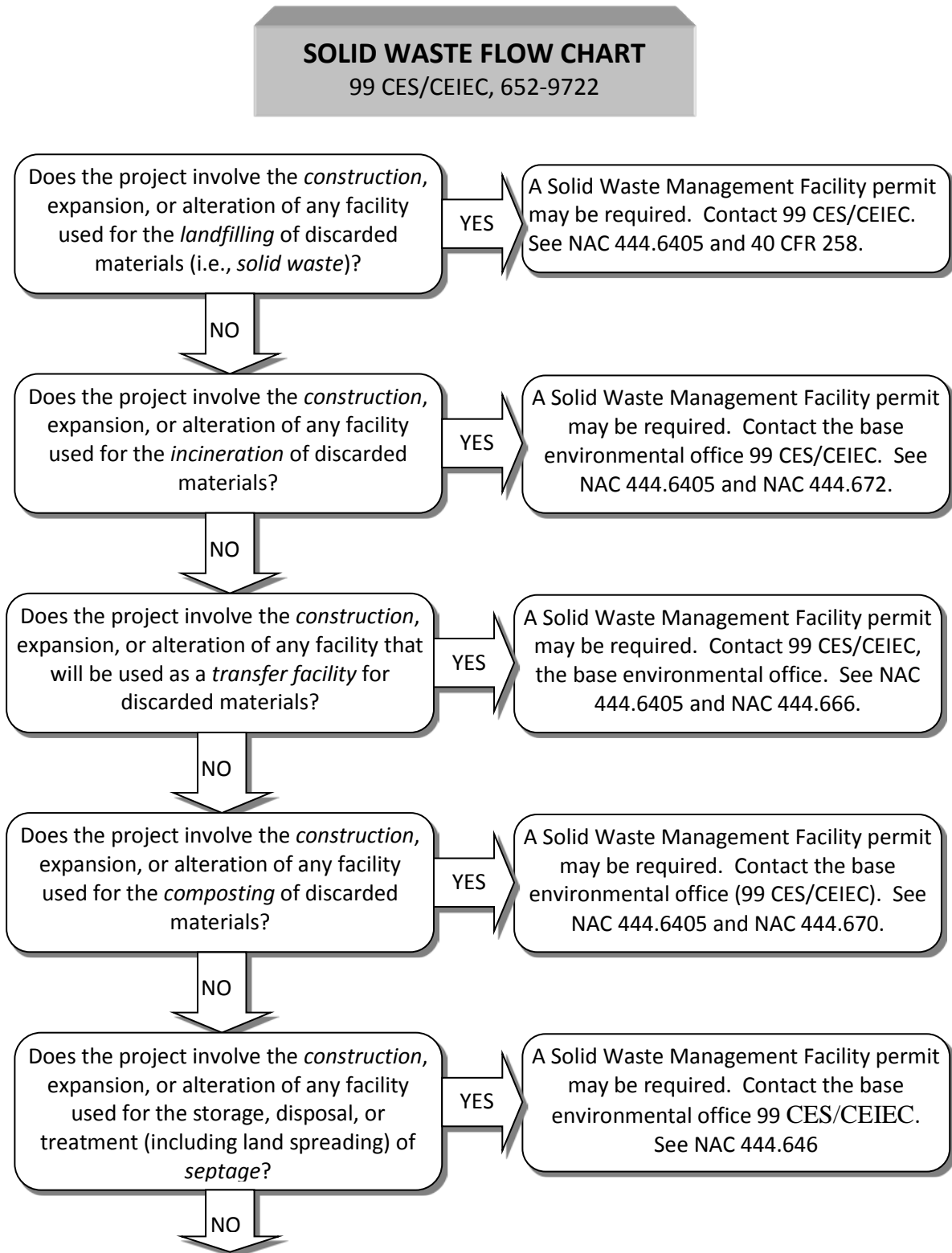
## Aboveground Storage Tanks (ASTs)

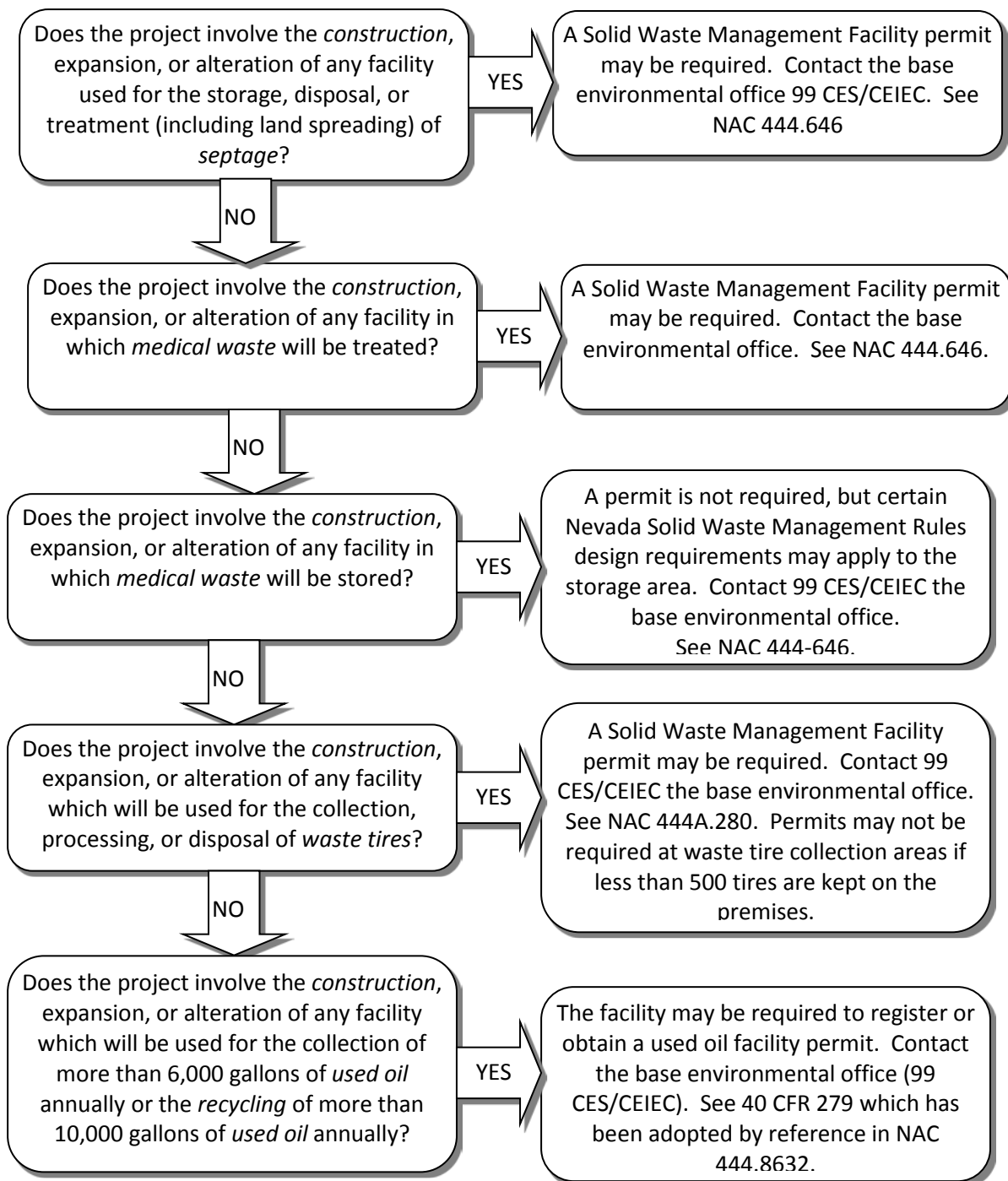
If any project involves the construction, removal or modification of an aboveground storage tanks (ASTs) or AST system, contact Nellis AFB POL Program Manager 99 CES/CEIEC at 652-6121



## SOLID WASTE 99 CES/CEIEC, 652-9722

Waste generated by construction or other activities are required to be disposed of properly depending on the waste involved. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Solid Waste Program Manager at 652-9722.

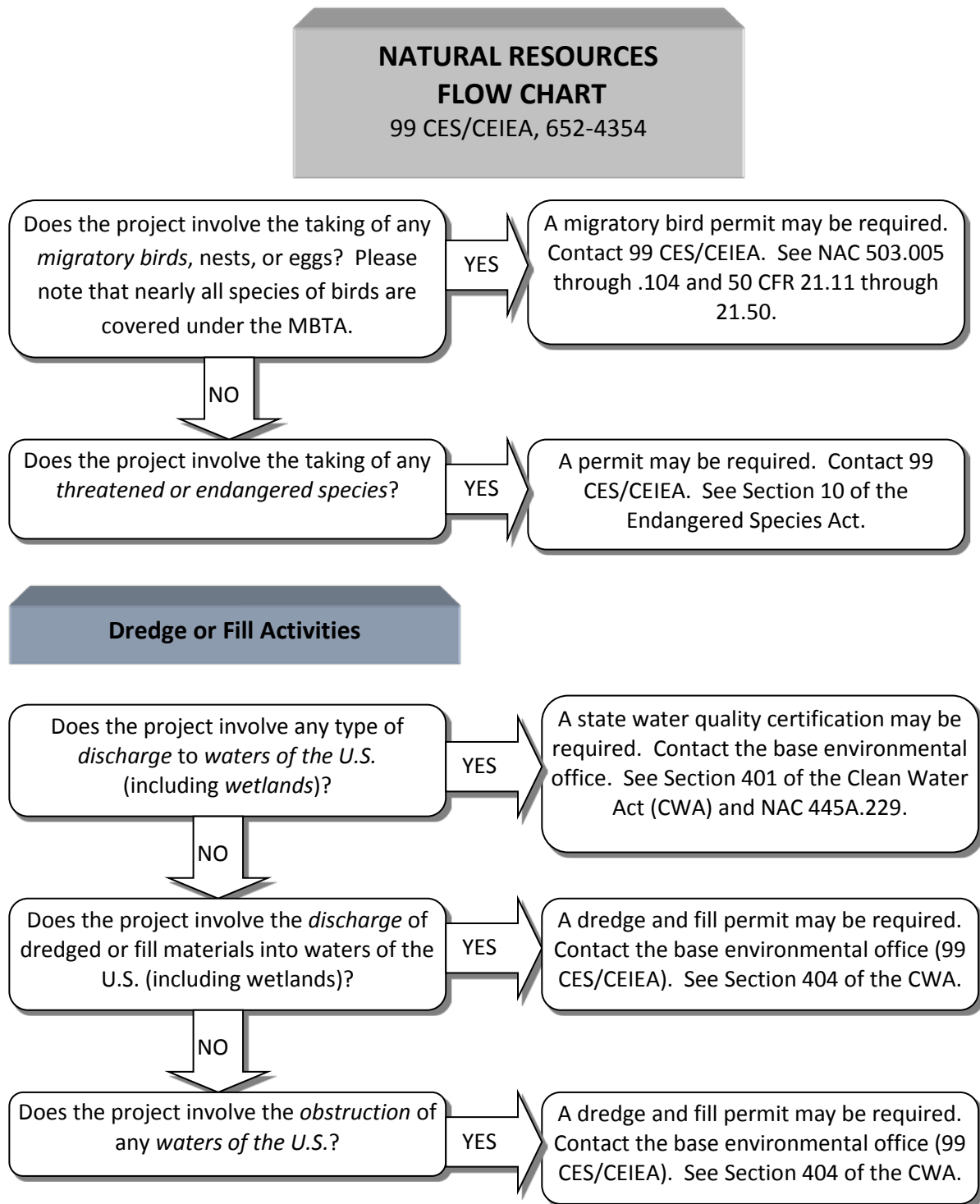




## NATURAL RESOURCES

99 CES/CEIEA, 652-4354

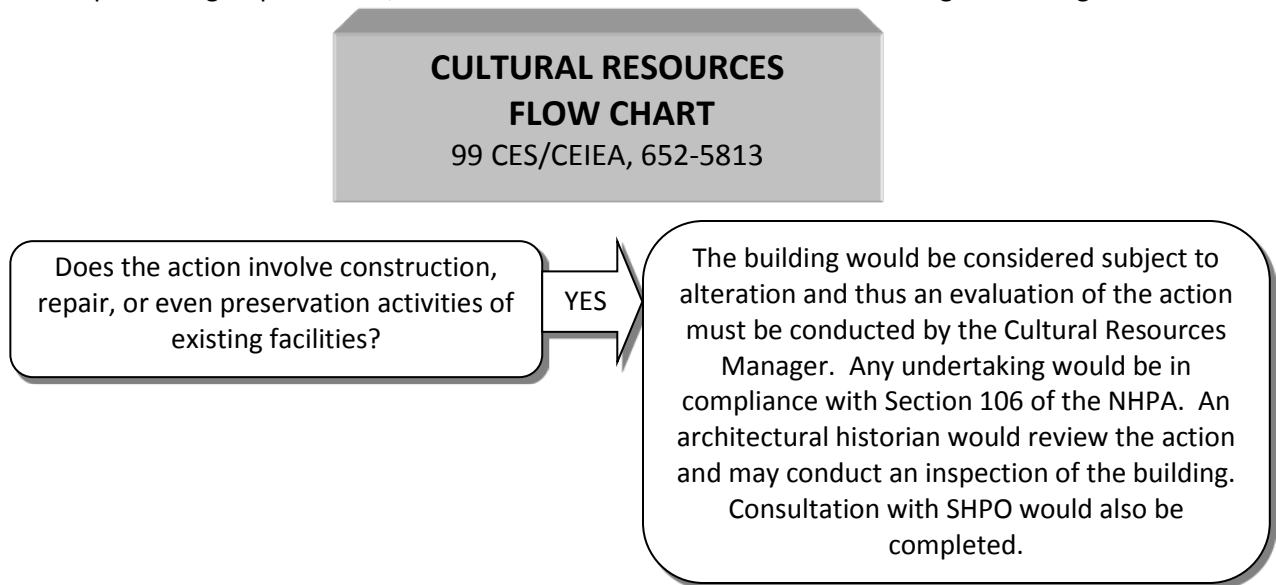
Any project that has the potential to impact wildlife, habitat, or potential wetlands may require permitting or other management activities. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Natural Resources Program Manager at 652-4354.



## CULTURAL RESOURCES

99 CES/CEIEA, 652-5813

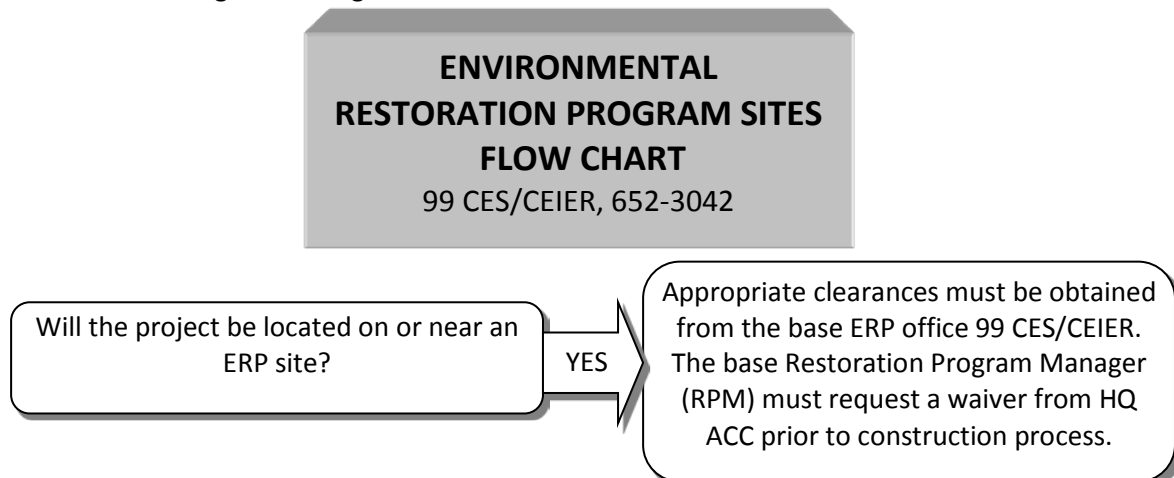
Federal laws require the Air Force to take efforts to identify and evaluate significant archaeological and Native American sites, and traditional cultural properties within all Areas of Potential Effect. The surface of Nellis Air Force Base land within Las Vegas Valley has been inventoried for prehistoric and historic cultural resources with consultation with the State in 2001. One eligible or significant site is located in Area II. As buildings age their cultural values may be increased. Building inventories for historic and Cold War era significance are conducted on a 5-7 year periodic basis. The last inventory was completed in 2007. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB Cultural Resources Program Manager at 652-5813.



## ENVIRONMENTAL RESTORATION PROGRAM SITES

99 CES/CEIER, 652-3042

Construction activities located on or near Environmental Restoration Sites could require HQ ACC and State approval. The flow chart in this section is designed to identify sources that could potentially require a permit, modification to an existing permit, or be subject to other regulatory requirements. In order to determine actual permitting requirements, contact the Nellis AFB ERP Program Manager at 652-3042.





## TERMS AND ACRONYMS

*Aboveground storage tank* — a tank that is situated in such a way that the entire surface of the tank is above the plane of the ground and the entire surface area of the tank (including the bottom) can be visually inspected.

*Air pollutant* — an air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive substance, or matter which is emitted into or otherwise enters the ambient air.

The following is a list of federally regulated air pollutants:

- (1) nitrogen oxides and volatile organic compounds;
- (2) any air pollutants for which a national ambient air quality standard has been promulgated including PM-10, sulfur dioxide, carbon monoxide, and lead;
- (3) any air pollutant or contaminant that is subject to any standard promulgated pursuant to Section III of the Clean Air Act including new source performance standards (NSPS) in 40 CFR part 60;
- (4) any class I or II substance (ozone depleting) subject to a standard promulgated pursuant to Section 601(a) of the Clean Air Act (see Appendix B);
- (5) any hazardous air pollutant identified in Section 112 of the Clean Air Act (see Appendix B).

*Ambient air* — that portion of the atmosphere outside of buildings and other enclosed structures, stacks or ducts, and which surrounds human, animal or plant life, or property.

*Asbestos* — substance comprised of or derived from actinolite, amosite, anthophyllite, chrysotile, crocidolite, or tremolite (40 CFR 61.14).

*Asbestos Containing Materials (ACM)* — any material or product which contains more than one percent asbestos.

*Category 1 Nonfriable Asbestos Containing Material (ACM)* — asbestos containing packing, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1 percent asbestos.

*Category 2 Nonfriable Asbestos* — any material including Category 1 nonfriable ACM containing more than 1% asbestos that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure (40 CFR 61.141).

*Characteristic hazardous waste* — any waste that exhibits the following characteristics:

- a liquid with a flash point of less than 140° F (40 CFR 261.21).
- a liquid with a pH less than or equal to 2 or greater than or equal to 12.5 (40 CFR 261.22).
- it is normally unstable, reacts violently with water, or is readily capable of detonation (40 CFR 261.23).
- an extract from a representative sample of the waste contains a listed contaminant at levels exceeding a given concentration (40 CFR 261.24).

*Composting* — the controlled decomposition of organic waste by naturally occurring bacteria.

*Construction* — change in method of operation or any physical change, including on-site fabrication, erection, installation, replacement, demolition, or modification of a source, that results in a change in emissions or affects the compliance status.

*Corrective action* — abatement measures associated with a response to a release of a hazardous waste, a hazardous substance or petroleum product.

*Demolition* — the wrecking or cutting out of any load supporting structural member of a facility (40 CFR 61.141).

*Discharge* — includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying or dumping.

*Discrete conveyance* — includes, but is not limited to, any pipe, ditch, channel, conduit, well, discrete fissure, or landfill leachate collection system through which wastewater or stormwater can be collected and discharged.

*Disposal* — the discharge, deposit, injection, dumping, spilling, leaking or placing of waste into or on any land or water so that it may enter the environment.

*Elementary neutralization unit* — a tank or container used for neutralizing wastes that are hazardous only because they exhibit the corrosivity characteristic (40 CFR 260.10).

*Fill* — any materials used to replace an aquatic area with dry land or to change the bottom elevation of a waterway.

*Fluid* — any material or substance that flows or moves whether in a semi-solid, liquid, sludge, gas, or any other form or state.

*Friable Asbestos Material* — any material that contains more than 1% asbestos by weight and can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure (40 CFR 61.141).

*Fuel burning equipment* — equipment whose primary purpose is the production of energy or power from the combustion of fuel. The equipment is generally used for, but not limited to, heating water, generating or circulating steam, heating air as in warm air furnace, or furnishing process heat by transferring energy by fluids or through process vessel walls.

*Groundwater* — water below the ground surface in a zone of saturation (40 CFR 144.3; 40 CFR 258.2).

*Hazardous substance* — any substance designated pursuant to Section 101(14) of CERCLA (including any substance regulated as a hazardous waste).

*Hazardous waste* — for a material to be classified as a hazardous waste it must be a *solid waste* and either exhibit a hazardous characteristic or be listed in 40 CFR 261.3 (40 CFR 261.10).

*Incineration* — process of burning solid waste.

*Industrial wastewater* — wastewater generated in a commercial or industrial process (40 CFR 503.9[n])

*Landfilling* — placement of waste in or on the ground.

*Lead Based Paint (LBP)* — lead was used as an ingredient in paint until 1978. It is highly toxic and poses a health threat, especially to children. Workers should avoid breathing dusts or fumes. Workers are covered under OSHA and contractors should comply with all requirements of 29 CFR 1926.62. Food and cosmetics should not be stored or used in work areas.

*Marine mammal* — any mammal that is morphologically adapted to the marine environment, or primarily inhabits the marine environment, including any part of any such marine mammal.

*Material handling equipment or activities* — include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product, or waste product.

*Medical waste* — waste which is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining to or in the production of testing of biologicals.

*Migratory bird* — any bird, including any part, nest, or egg of any such bird, designated as such in a treaty to which the United States is a party.

*Obstruction* — may include construction of a wharf, pier, breakwater or any other structure and the excavation, filling or any other alteration of a navigable water.

*Open burning* — any outdoor fire or outdoor smoke producing process from which air contaminants are emitted directly into the outdoor atmosphere.

*Ozone depleting substances (ODS)* — compounds that contribute to stratospheric ozone depletion. ODS include CFCs, HCFCs, halons, methyl bromide, carbon tetrachloride, and methyl chloroform. ODS are generally very stable in the troposphere and only degrade under intense ultraviolet light in the stratosphere. When they break down, they release chlorine or bromine atoms, which then deplete ozone.

*PCB Item* — an article, container, or equipment that deliberately or unintentionally contains or has in part of it any PCB or PCBs (40 CFR 761.3).

*Polychlorinated Biphenyl (PCB)* — a synthetic, organic chemical once widely used in electrical equipment, specialized hydraulic systems, heat transfer systems, and other industrial products. PCBs are highly toxic and a potent carcinogen. Any hazardous wastes that contain more than 50 parts per million of PCBs are subject to regulation under the Toxic Substances Control Act.

*Pesticide* — any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, or intended for use as a plant regulator, defoliant.

*Petroleum* — petroleum, including crude oil or any fraction thereof that is liquid at standard temperature and pressure conditions.

*Pretreatment* — the reduction in the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants to a publicly owned treatment works (40 CFR 403.3[q]).

*Process wastewater* — any water that comes into direct contact with, or results from the production or use of, any raw material, intermediate product, finished product, or waste product during manufacturing or processing (40 CFR 401.44[q]).

*Public water system* — a system for providing piped water to the public for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

*Radioactive materials* — any substance that emits radiation including alpha particles, beta particles, gamma rays, x-rays, neutrons, and other particles capable of producing ions. Radioactive materials that produce ionizing radiation are not covered in this manual (e.g. radio & microwaves).

*Recycling* — to prepare used oil for re-use as a petroleum product.

*Regulated Asbestos Containing Material (RACM)* — including friable asbestos material; category I nonfriable ACM that has become friable; Category I nonfriable ACM that has been subject to grinding, casting, cutting or abrading; and Category II nonfriable ACM that has a highly probability of becoming crumbled, crushed or pulverized (40 CFR 61.141).

*Renovation* — means the altering of a facility or facility component in any way, including the stripping or removal of RACM from a facility component.

*Restricted use pesticides* — See 40 CFR 171.2 for listing of Restricted Use Pesticides.

*Runoff* — rainwater, leachate, or other liquid that drains overland on any part of a ground surface and runs off of the ground surface (40 CFR 503.9[v]).

*Sanitary wastewater* — wastewater generated by toilets, sinks, and non-industrial/domestic activities; domestic sewage.

*Scrap tires* — tires that are no longer suitable for their original intended purpose because of wear or damage.

*Septage* — a fluid mixture of untreated and partially treated sewage solids, liquids, and sludge of human or domestic origin which is removed from a wastewater system.

*Solid waste* — any garbage refuse or sludge or other material that is either discarded or being accumulated, stored, or treated prior to being discarded or has served its original intended use and is generally discarded. Includes industrial and municipal wastes are examples of solid wastes. Solid waste does not include wastewater discharges regulated under the Clean Water Act or domestic sewage and sludges generated in sanitary sewage collection systems designed to discharge effluents to surface waters.

*Source* — any stationary article, machine, process equipment, or other contrivance, or combination thereof, or any tank-truck, trailer or railroad car from which air pollutants emanate or are emitted, either directly or indirectly.

*Store* — hold hazardous waste for a temporary period. Accumulation time is calculated from the time hazardous waste is first placed in a container.

*Stormwater* — stormwater runoff, snow melt runoff, and surface runoff and drainage (40 CFR 122.26[b][13]).

*Surface water* — all water that is open to the atmosphere and subject to surface runoff (40 CFR 141.2).

*Threatened or endangered species* — any species that is in danger of extinction throughout all or a significant portion of its range (see 50 CFR 81.1).

*Totally enclosed treatment facility* — facility for treatment of hazardous waste which is directly connected to any industrial production process (40 CFR 260.10).

*Transfer station/Transfer facility* — permanent structure with mechanical equipment used for the collection or compaction of solid waste prior to transportation for final disposal.

*Treatment* — any method, technique or process, including neutralization, designed to change the physical, chemical or biological character of a hazardous waste (40 CFR 260.10).

*Treatment works* — either a federally owned, publicly owned, or privately owned device or system used to treat either sanitary wastewater or a combination of sanitary wastewater and industrial or process wastewater (including recycle and reclaim) (40 CFR 503.9[aa]).

*Underground Storage Tank (UST)* — any one or combination of tanks (including underground pipes) the volume of which is 10% or more beneath the surface of the ground.

*Underground well injection* — the subsurface placement of fluids through a bored, drilled, or driven shaft (well), or a dug well, where the depth of the dug well is greater than the largest surface dimension.

*Used oil* — any oil which has been refined from crude oil or synthetic oil and, as a result of use, storage or handling has become unsuitable for its original purpose but which may be suitable for further use.

*Wastewater reservoir* — a pond, lagoon, retention basin, or other surface impoundment that is used to receive industrial or process wastewater.

*Waters of the U.S.* — all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including:

- all waters which are subject to the ebb and flow of the tide;
- all interstate waters, including interstate wetlands (see definition);
- all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters used for recreation, commercial fishing, and industrial purposes; impoundments of waters otherwise defined as waters of the U.S. under this definition;
- tributaries of waters identified above;
- territorial seas; and
- wetlands adjacent to waters other than wetlands identified above (40 CFR 122.2).

*Wetlands* — those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR 122.2).

## ENVIRONMENTAL PERMIT SCREENING MODEL CHECKLIST

Base: \_\_\_\_\_

Project Name: \_\_\_\_\_

Project Number: \_\_\_\_\_

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

Name of Preparer: \_\_\_\_\_

|   | Potential Permit/Approval Requirements |                          | Comments |
|---|--|--------------------------|----------|
|   | Y                                      | N                        |          |
| <b>WATER (Section 1)</b>  |  |                          |          |
| Underground injection Well                                      | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Industrial Wastewater   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Sanitary Wastewater   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Stormwater  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Dredge or Fill  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Drinking Water  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>HAZARDOUS MATERIAL/HAZARDOUS WASTE/PCBs/ODSs (Section 2)</b> |  |                          |          |
| Usage   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Tracking  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Storage   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Treatment   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Disposal  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>SOLID WASTE (Section 3)</b>                                  |  |                          |          |
| Landfilling   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Incineration  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Transfer  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Composting  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Landspreading   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Medical Waste   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Scrap Tires   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Used Oil  | <input type="checkbox"/>               | <input type="checkbox"/> |          |

| ENVIRONMENTAL PERMIT SCREENING MODEL CHECKLIST (con't) |  |                          |          |
|--|--|--------------------------|----------|
|  | Potential Permit/Approval Requirements |                          | Comments |
|  | Y                                      | N                        |          |
| <b>AIR (Section 4)</b>                                 |  |                          |          |
| Boilers  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Incinerators   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Fuel Burning Equipment                                 | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Miscellaneous Units                                    | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Petroleum Storage                                      | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Jet Engine Test Facilities                             | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Transportation Facilities                              | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>STORAGE TANKS (Section 5)</b>                       |  |                          |          |
| USTs   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| ASTs   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>PESTICIDES (Section 6)</b>                          |  |                          |          |
| Application  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Use  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>ASBESTOS (Section 7)</b>                            |  |                          |          |
| Regulated Asbestos Containing Materials                | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>RADIOACTIVE MATERIALS (Section 8)</b>               |  |                          |          |
| Radioactive Materials                                  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>WILDLIFE AND WILDLIFE HABITAT (Section 9)</b>       |  |                          |          |
| Migratory Birds  | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Threatened or Endangered Species                       | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| Marine Mammals   | <input type="checkbox"/>               | <input type="checkbox"/> |          |
| <b>INSTALLATION RESTORATION PROJECT (Section 10)</b>   |  |                          |          |
| Installation Restoration Project                       | <input type="checkbox"/>               | <input type="checkbox"/> |          |

## FEDERAL REGULATIONS CITED

| <b><u>CITATION</u></b> | <b><u>TITLE</u></b>  |
|------------------------|--|
| 10 CFR 30-72           | Licensing of Radioactive Materials   |
| 29 CFR 1926            | Safety and Health Regulations for Construction   |
| 40 CFR 60              | Standards of Performance for New Stationary Sources  |
| 40 CFR 61              | National Emission Standards for Hazardous Air Pollutants   |
| 40 CFR 112             | Oil Pollution Prevention   |
| 40 CFR 122             | National Pollutant Discharge Elimination System  |
| 40 CFR 141             | National Primary Drinking Water Regulations  |
| 40 CFR 144             | Underground Injection Control Program  |
| 40 CFR 145             | State UIC Program Requirements   |
| 40 CFR 165             | Pesticides   |
| 40 CFR 258             | Criteria for Municipal Solid Waste Landfills   |
| 40 CFR 260             | Hazardous Waste Management System: General   |
| 40 CFR 261             | Identification and Listing of Hazardous Wastes   |
| 40 CFR 262             | Standards Applicable to Generators of Hazardous Waste  |
| 40 CFR 264             | Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities                |
| 40 CFR 265             | Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities |
| 40 CFR 279             | Standards for the Management of Used Oil   |
| 40 CFR 280             | Technical Standards and Corrective Action Requirements for Owners and Operators of USTs                        |
| 40 CFR 401             | General Provisions   |
| 40 CFR 403             | General Pretreatment Regulations for Existing and New Sources of Pollution                                     |
| 40 CFR 413             | Electroplating Point Source Category   |
| 40 CFR 433             | Metal Finishing Point Source Category  |
| 40 CFR 459             | Photographic Point Source Category   |
| 40 CFR 460             | Hospital Point Source Category   |
| 40 CFR 503             | Standards for the Use or Disposal of Sewage Sludge   |
| 40 CFR 761             | PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions                                  |
| 40 CFR 763             | Asbestos   |
| 50 CFR 21              | Wildlife and Fisheries   |
| 50 CFR 81              | Conservation of Endangered and Threatened Species of Fish, Wildlife, and Plants                                |



## FEDERAL LAWS CITED

|                                |             |   |
|--------------------------------|-------------|---|
| Clean Water Act (CWA)          | Section 401 | Certification   |
| Clean Water Act (CWA)          | Section 404 | Permits for Dredge and Fill Material                          |
| Rivers and Harbors Act of 1989 | Section 10  | Obstruction of Excavations and Filling in of Navigable Waters |
| Clean Air Act (CAA)            | Title I     | Air Pollution Prevention and Control                          |
| Clean Air Act (CAA)            | Title VI    | Stratospheric Ozone Protection                                |
| Endangered Species Act         | Section 10  | Exceptions  |
| Marine Mammal Protection Act   | Section 104 | Permits   |

## OTHER REGULATORY REFERENCES

### County

Clark County Air Quality Regulations (includes regulations on NESHAP, Asbestos, boilers and steam generators, fuel burning equipment, and testing/monitoring)

Construction Activities Dust Control Handbook, Clark County Department of Air Quality and Environmental Management

### State

| <u>CITATION</u> | <u>TITLE</u>  |
|-----------------|---|
| NAC 444         | Sanitation  |
| NAC 444A        | Programs for recycling  |
| NAC 445A        | Water Controls  |
| NAC 445B        | Air Pollution   |
| NAC 459         | Hazardous Materials   |
| NAC 555         | Control of Insects, Pests, and Noxious Weeds                      |
| NAC 590         | Petroleum Products and Antifreeze                                 |
| NAC 503         | Hunting, Fishing, and Trapping; Miscellaneous Protective Measures |
| NAC 618         | Occupational Safety and Health                                    |

## **APPENDIX D**

# **INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING CORRESPONDENCE AND PUBLIC PARTICIPATION**

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**PUBLIC NOTIFICATION, DISTRIBUTION, AND  
COMMENTS TO THE DRAFT ENVIRONMENTAL  
ASSESSMENT AND FINDING OF NO SIGNIFICANT  
IMPACT**

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## PUBLIC NOTIFICATION

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**As part of the public involvement process, Nellis AFB has published a Notice of Availability of the Draft Environmental Assessment and Finding of No Significant Impact on 26 June, 2013 in the Las Vegas Review-Journal.**

*Notice of Availability  
Draft Environmental Assessment  
For Nellis Air Force Base Capital Improvements Program*

The U.S. Air Force has prepared a draft Environmental Assessment (EA) that analyzed the Capital Improvements Program (CIP) resulting from updating the 2008 Nellis AFB CIP to account for significant mission changes. The CIP would include construction, demolition, renovation, and maintenance at Nellis AFB. By taking a comprehensive approach to planning and implementing the facilities and infrastructure improvements over a multi-year period, Nellis AFB would maximize the use of funds, conserve energy, and meet operational goals. This EA has been prepared in accordance with the National Environmental Policy Act.

A copy of the Draft EA and Draft Finding of No Significant Impact are available for review and comment at the following libraries beginning June 26, 2013.

Las Vegas Library – *Las Vegas*

North Las Vegas Library District Main  
Branch – *North Las Vegas*

You may request a copy of the document from the Nellis AFB Public Affairs Office by calling (702) 652-2753 or by writing to the address below. An electronic version of the EA is available for public review at [www.nellis.af.mil/library/environment.asp](http://www.nellis.af.mil/library/environment.asp). Please provide any comments on the Draft EA by July 25, 2013. Comments should be forwarded to: 99 ABW/PA Director, 4430 Grissom Avenue, Ste 107, Nellis AFB NV 89191.

**DISTRUBUTION AND COMMENTS OF THE  
DRAFT EA AND FONSI**

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# DISTRIBUTION LIST

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Nevada State Clearinghouse  
Department of Administration  
Division of Budget & Planning  
209 East Musser Street, Room 200  
Carson City, NV 89701-4298  
clearinghouse@budget.state.nv.us  
(electronic coordination)

Commissioner Steve Sisolak, Chairperson  
Clark County Commission  
500 Grand Central Parkway  
Las Vegas, NV 89109

Mr. John Mendoza, S. Planner  
Clark County Department of Air Quality & Environmental Management  
500 S. Grand Central Parkway  
P.O. Box 555210  
Las Vegas, NV 89155

Ms Jennifer Olsen  
Southern Nevada Regional Planning Coalition  
Clark County Clearinghouse  
240 Water Street Mail Stop 115  
Henderson, NV 89009

City of North Las Vegas  
2250 Las Vegas Boulevard North  
North Las Vegas, NV 89030

Mr. Mario Bermudez, Planning Manager  
Clark County Department of Comprehensive Planning  
500 S. Grand Central Parkway, First Floor  
Las Vegas, NV 89155

Las Vegas Library  
Reference Department  
833 Las Vegas Blvd North  
Las Vegas, NV 89101

North Las Vegas Library District – Main Branch  
Reference Department  
2300 N Civic Center Drive  
North Las Vegas, NV 89030

# **SAMPLE DISTRIBUTION LETTER**

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DEPARTMENT OF THE AIR FORCE  
99TH CIVIL ENGINEER SQUADRON (ACC)  
NELLIS AIR FORCE BASE, NEVADA

Ms. Lynn Haarklau  
99 CES/CENP  
6020 Beale Avenue  
Nellis AFB, NV 89191-7260

JUN 20 2013

Commissioner Steve Sisolak, Chairperson  
Clark County Commission  
500 Grand Central Parkway  
Las Vegas, NV 89109

Dear Mr. Sisolak

The United States Air Force has prepared a draft Environmental Assessment (EA) for the proposed action to update the Nellis Air Force Base (AFB) Capital Improvements Program (CIP). This update reflects current conditions and makes recommendations for improvements to Nellis AFB. The CIP for Nellis AFB describes discrete projects, such as major utility upgrades or construction of individual facilities, also reflects planned changes to enhance mission capability, correct space and/or infrastructure deficiencies, and to support future development through modernization, restoration, and sustainment projects.

In addition to the proposed action, this draft EA assesses the no-action alternative. Under the no-action alternative, the proposed CIP would not be implemented, but some construction, demolition, or infrastructure improvement projects would be implemented in accordance with the old CIP. Projects not previously identified in the 2008 CIP would be analyzed individually in a case-by-case basis.

In accordance with 32 CFR 989, the Air Force *Environmental Impact Analysis Process (EIAP)*, and 40 CFR 1500-1508, the *Council on Environmental Quality* guidelines, pursuant to the *National Environmental Policy Act*, as amended, Nellis AFB requests your agency review the assessment of the proposed action. Please send any comments no later than July 25, 2013 to Mr. Tod Oppenborn at the above address or e-mail him at [tod.oppenborn@nellis.af.mil](mailto:tod.oppenborn@nellis.af.mil). Thank you for your participation.

Sincerely

LYNN HAARKLAU  
Chief, Portfolio Optimization

Attachment:

Draft Nellis AFB Capital Improvements Program Environmental Assessment and FONSI

*Enable Success Through Innovative Base Support*

## **COMMENTS RECEIVED FOR DRAFT EA**

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CLARK COUNTY • DEPARTMENT OF AIR QUALITY  
4701 W. Russell Road Suite 200 • Las Vegas, NV 89118-2231  
(702) 455-5942 • Fax (702) 383-9994  
Lewis Wallenmeyer Director

July 22, 2013

Tod Oppenborn  
99 ABW/PA  
4430 Grissom Ave, Suite 107  
Nellis AFB NV 89191  
ATTN: 99 ABW/PA Director

E-mail: [tod.oppenborn@nellis.af.mil](mailto:tod.oppenborn@nellis.af.mil)

**Re: Nellis Air Force Base Capital Improvements Program Draft Environmental Assessment (EA)**

Dear Mr. Oppenborn:

Nellis proposes to initiate updates to the 2008 Capital Improvements Program, which includes construction, demolition, renovation, and maintenance activities at the base. The Department of Air Quality (DAQ) has reviewed the draft EA for compliance with air quality regulations, and determines that this action should have no significant impacts to the ambient air quality.

Regarding the project, DAQ would like to offer some potentially pertinent information. The proposed project is located within Hydrographic Area 212, which is a maintenance area for carbon monoxide and ozone, and a nonattainment area for particulate matter with a mean aerodynamic diameter less than 10 microns, so the following provisions may apply:

According to Section 94 of the AQR, a dust control permit must be obtained prior to soil disturbing or construction activities that impact 0.25 acres or greater, mechanized trenching 100 feet or greater in length, or mechanical demolition of any structure 1,000 square feet or greater. Construction activities include, but are not limited to, land clearing; soil and rock excavation, removal, hauling, crushing or screening; initial landscaping; staging and material storage areas; parking; and access roads. In addition, construction projects ten acres or more, trenching activities one mile or greater, or structure demolition using implosive or explosive blasting techniques shall include a detailed supplement to the dust mitigation plan that will become part of the dust control permit as an enforceable permit condition. A Demolition Notification Form shall be submitted before a building or structure is to be demolished. If the building or structure contains friable asbestos-containing materials, the NESHAP Notification of Asbestos Abatement Form must be completed and submitted to DAQ.

BOARD OF COUNTY COMMISSIONERS  
Steve Sisolak, Chair • Larry Brown, Vice-Chairman  
Susan Brager • Tom Collins • Chris Giunchigliani  
Mary Beth Scow • Lawrence Weekly  
Don Burnette, County Manager



CLARK COUNTY • DEPARTMENT OF AIR QUALITY  
4701 W. Russell Road Suite 200 • Las Vegas, NV 89118-2231  
(702) 455-5942 • Fax (702) 383-9994  
Lewis Wallenmeyer Director

Construction activities include, but are not limited to land clearing; soil and rock excavation, removal, hauling, crushing or screening; initial landscaping; staging and material storage areas; parking; and access roads. Best Available Control Measures must be employed during construction activities at all times. These measures are contained in the *Construction Activities Dust Control Handbook*, which is available online at [http://www.clarkcountynv.gov/Depts/AirQuality/Documents/DustControl/DustForms/DUST\\_CONTROL\\_HANDBOOK.pdf](http://www.clarkcountynv.gov/Depts/AirQuality/Documents/DustControl/DustForms/DUST_CONTROL_HANDBOOK.pdf)

Last, the EA refers to emissions calculation worksheets, but they have not been included with the draft copy. Once they have been incorporated, it is recommended that the reference for the demolition and construction emission factors be included as well.

DAQ appreciates the opportunity to review the EA in advance. If you have any questions, please contact me at (702) 455-1600.

Sincerely,

Lewis Wallenmeyer  
Director

LW:dll

BOARD OF COUNTY COMMISSIONERS  
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Mary Beth Scow • Lawrence Weekly  
Don Burnette, County Manager

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## **APPENDIX E**

### **NEVADA DIVISION OF WILDLIFE - GILA MONSTER STATUS, IDENTIFICATION AND REPORTING PROTOCOL FOR OBSERVATIONS**

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# NEVADA DEPARTMENT OF WILDLIFE

## Southern Region

4747 W. Vegas Drive, Las Vegas, Nevada 89108  
Phone: 702-486-5127, Fax: 702-486-5133



7 September 2012

## GILA MONSTER STATUS, IDENTIFICATION AND REPORTING PROTOCOL FOR OBSERVATIONS

### Gila Monster Status

- Per Nevada Administrative Code 503.080, the Gila monster (*Heloderma suspectum*) is classified as a Protected reptile.
- Per Nevada Administrative Codes 503.090, and 503.093, no person shall capture, kill, or possess any part thereof of Protected wildlife without the prior written permission by the Nevada Department of Wildlife (NDOW).

This species is rarely observed relative to other species which is the primary reason for its Protected classification by the State of Nevada. The USDI Bureau of Land Management has recognized this lizard as a sensitive species since 1978. Most recently, the Gila monster was designated as an *Evaluation* species under Clark County's Multiple Species Habitat Conservation Plan (MSHCP). The evaluation designation was warranted because inadequate information exists to determine if mitigation facilitated by the MSHCP would demonstrably cover conservation actions necessary to insure the species' persistence without protective intervention as provided under the federal Endangered Species Act.

The banded Gila monster (*H.s. cinctum*) is the subspecies that occurs in Clark, Lincoln, and Nye counties of Nevada. Found mainly below 5,000 feet elevation, its geographic range approximates that of the desert tortoise (*Gopherus agassizii*) and is coincident to the Colorado River drainage. Gila monster habitat requirements center on desert wash, spring and riparian habitats that inter-digitate primarily with complex rocky landscapes of upland desert scrub. They will use and are occasionally encountered out in gentler terrain of alluvial fans (bajadas). Hence, Gila monster habitat bridges and overlaps that of both the desert tortoise and chuckwalla (*Sauromalus ater*). Gila monsters are secretive and difficult to locate, spending >95% of their lives underground.

The Gila monster is the only venomous lizard endemic to the United States. Its behavioral disposition is somewhat docile and avoids confrontation. But it will readily defend itself if threatened. Most bites are considered illegitimate and consequential to harassment or careless handling. These lizards are not dangerous unless molested or handled and should not be killed.

Scant information exists on detailed distribution and relative abundance in Nevada. The Nevada Department of Wildlife (NDOW) has ongoing management investigations addressing the Gila monster's status and distribution, hence additional distribution, habitat, and biological



information is of utmost interest. In assistance to gathering additional information about Gila monsters in Nevada, NDOW will be notified whenever a Gila monster is encountered or observed, and under what circumstances (see Reporting Protocol below).

## Identification



The Gila monster is recognizable by its striking black and orange-pink coloration and bumpy, or beaded, skin. In keeping with its namesake, the banded Gila monster retains a black chain-link, banded appearance into adulthood. Other lizard species are often mistaken for the Gila monster. Of these, the non-venomous western banded gecko (*Coleonyx variegatus*) and non-venomous chuckwalla are most frequently confused with the Gila monster. All three species share the same habitats.

The western banded gecko is often mistakenly identified as a baby or juvenile Gila monster. Western banded geckos do have a finely granular skin and pattern that can be suggestive of the Gila monster to the untrained eye. However, western banded gecko heads are somewhat pointed at the snout and the relatively large eyes have vertical pupils. Snouts of Gila monsters are bluntly rounded and the smallish eyes have round pupils. Newly hatched Gila monsters are about 5-6 inches long with a vivid orange and black, banded pattern. Adult western banded geckos are at best cream to yellow and brown in pattern and do not exceed 5 inches.



Both juvenile and adult chuckwallas are commonly confused with the Gila monster. Juvenile chuckwallas have an orange and black, banded tail. Although banding of the tail fades as chuckwallas mature, their large adult size (up to 17 inches) rivals that of the Gila monster. Adult chuckwallas have a body shape somewhat suggestive of the Gila monster, but they lack the coarsely beaded skin and black and orange body pattern of the Gila monster.

## Reporting Protocol for Gila Monster Observations

Field workers and personnel in southern Nevada should at least know how to: (1) identify Gila monsters and be able to distinguish it from other lizards such as chuckwallas and western banded geckos (see Identification section above); (2) report any observations of Gila monsters to the Nevada Department of Wildlife (NDOW); (3) be alerted to the consequences of a Gila monster bite resulting from carelessness or unnecessary harassment; and (4) be aware of protective measures provided under state law.

- 1) Live Gila monsters found in harms way on the construction site will be captured and then

detained in a cool, shaded environment ( $\leq 85^{\circ}\text{F}$ ) by the project biologist or equivalent personnel until a NDOW biologist can arrive for documentation, marking and obtaining biological measurements and samples prior to releasing. Despite that a Gila monster is venomous and can deliver a serious bite, its relatively slow gate allows for it to be easily coaxed or lifted into an open bucket or box carefully using a long handled instrument such as a shovel or snake hook (*Note: it is not the intent of NDOW to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points*). A clean 5-gallon plastic bucket with a secure, vented lid; an 18"x 18"x 4" plastic sweater box with a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location, Global Positioning System (GPS) coordinates in Universal Transverse Mercator (UTM) using the North American Datum (NAD) 83 zone 11. Date, time, and circumstances (e.g. biological survey or construction) and habitat description (vegetation, slope, aspect, substrate) will also be provided to NDOW.

- 2) Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses will not be covered by NDOW. However, NDOW will be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, date, time, habitat, and mapped location (GPS coordinates in UTM using NAD 83 Z 11).
- 3) Should NDOW's assistance be delayed, biological or equivalent acting personnel on site should detain the Gila monster out of harms way until NDOW personnel can respond. **The Gila monster should be detained until NDOW biologists have responded.** Should NDOW not be immediately available to respond for photo-documentation, a digital (5 megapixel or higher) or 35mm camera will be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures will be provided to NDOW at the address above or the email address below along with specific location information including GPS coordinates in UTM using NAD 83 Z 11, date, time and habitat description. Pictures will show the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).

Please contact NDOW Biologist Jason L. Jones at 702-486-5127 x3718  
or by e-mail at [jljones@ndow.org](mailto:jljones@ndow.org) for additional information regarding these protocols.